A STUDY OF CERTAIN MOTIVATIONAL PATTERNS
IN THE UNITED STATES NAVY SUBMARINE SERVICE

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by

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ABSTRACT

1069 questionnaires from officers and men of 44 submarines

of the U. S. Atlantic and Pacific Fleets were analyzed to determine

existing motivations for service in the Navy and in submarines, and

to compare the level of perceived need satisfactions with perceived

need importance. Significant differences between the motivational

patterns of officers and enlisted men were discovered, with the

officers generally more "job motivated" than the enlisted. The

implications of pay as a "motivator" were discussed. Minor

differences were found among the sub-populations of the enlisted

sample, primarily among different types of submarines. The fleet

ballistic missile submarine group appeared to be the most highly

"job oriented" and the diesel-electric group the most "group or boat

oriented." The nuclear attack submarine group appeared to be the

least satisfied of the three submarine groups. The most significant

deficiency perceived by all enlisted groups was the lack of trust

and authority granted them for independent judgment and actions.

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CHAPTER I

INTRODUCTION

Motivation for submarine service has been a favorite subject
for military psychologists, particularly since World War II. The
success of submarine warfare during the War and the nature of
the environment in which the submarine operates, has increased
the desire to learn what special motivations, if any, this breed of
men must possess to succeed so well under such unusual conditions.
The growing interest and penetration of outer and inner space (the
ocean deeps), carrying implications of large, future personnel
requirements, fostered many studies concerning the submariner
and his interactions with a potentially hazardous and isolated
environment. Studies of the effects of the restricted environment
of a submarine, [15] the effects of stress under the combat conditions
of WW II, [24] [9] and the criteria and methods of selecting
officer and enlisted personnel, [5] [22] have been carried out
since 1945.

I. BACKGROUND

Morale and motivation are closely related. Morale has been
defined as, "the extent to which an individual's needs are satisfied
and the extent to which the individual perceives that satisfaction
as stemming from his total job situation." [12] . In this context
morale is perceived as being an inseparable part of the individual's
relationship with the group of which he is a part. High morale

exists when an individual considers himself to be a member of a particular group, and believes that his own personal goals and those of his group are in harmony. He seeks to foster the goals of the group because the goals of the group enhance and further his own personal goals. Motivation has been defined as, "a state of energy-mobilization oriented toward some perceived or imagined goal-object or goal-situation.." [2] Motivational analysis can be properly examined in three phases: 1) the individual's private goals; 2) the group goals; and 3) the perceived relationships between these sets of goals. [2] The investigation of an submariner's personal goal-objects is a multi-dimensional subject beyond the scope of this paper. Rather, the paper will be concerned with the relative differences between certain submarine sub-population's conceptions of the relationships among private and group goal satisfaction.

Empirical studies by Lewis (1944) and Horwitz (1954) have shown that the morale of an individual is interdependent with the group goals of the organization of which he is a part. [14] Stagner (1958) indicates that the closer an individual perceives his own goals to be to the group goals, the higher will be his morale. [23] If the wants and goals of the members of a group change, the functions of the group must show corresponding changes if the group is to survive. [14] This study was undertaken because of the author's belief that not only have the nature

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and goals of the modern submarine changed, but so have the needs

of the men who man our present-day submarines.

The evolutionary changes in the Submarine Force. It has been

tradition in the Submarine Force since the very earliest days, that

submariners were the most highly motivated, elite, and proud

group in the Navy. A typical description of submarine motivation

used by submarine medical personnel was, "the submariner regards

being a submariner as a very significant role, the most important

niche he can fill in life....The very human need to feel significant

appears to be at the heart of motivation for submarine service."[1]

Yet, in 1961 there appeared to be some indications that the

traditional concepts of submarine morale and motivation needed

sharper definition because of the massive expansion of the Force

within a very short time span. For the first time large numbers of

men were being sent to submarine duty directly from "boot camp."

Even more disturbing was the fact that large numbers of qualified

submarine personnel in diesal-electric submarines were refusing

to volunteer for the nuclear power training program.

During the last five years the composition of the submarine

force has continued to change. Submariners now comprise almost

5% of the Navy; during WW II about 0.5% of the Navy were

submariners. Today the size of the FBM force in the Atlantic is

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[1]A. S. Levin, Habitability and Motivation as Related to the
Polaris Submarine, Polaris Personnel Research Memorandum FBM-11,
Personnel Research Division, Bureau of Naval Personnel (Washington,
1958), p. 5.

as great as the entire Submarine Force, Pacific. The traditional concept of the submarine as a unit designed to aggressively seek out and attack the enemy, has been replaced by the mission of a large proportion of the Force, the FBM submarine, to avoid contact by all possible means. In 1961 only 8% of the men on diesel electric submarines regretted their decision to make the Navy a career; 31% of the men serving on nuclear submarines regretted that decision. In 1961 most of the nuclear powered submarines were in the construction or post-construction phase. Today these submarines have all experienced several years of at sea operating, including many FBM patrol operations. Five years ago most of the submariners had some experience with the surface side of the Navy. Today many of the men on submarines know only one type of duty in the Navy – submarine duty. The type vessels that now make up a large portion of the Submarine Force require individuals of the highest intelligence available to the Navy, and individuals who are more highly trained than ever before. The majority of young men who man our submarines today were born during or after WW II; they grew up in a cultural environment quite different from the pre-WW II era.

II. PURPOSE AND SIGNIFICANCE OF THE STUDY

Purpose. It is the purpose of this study, using a questionnaire received from a representative submarine sample, to:

1) Determine the present attitudes of submarine personnel in 1966 regarding their service in the Navy, and their selection and continuation of submarine type duty.

2) Determine which need satisfactions submarine personnel perceive to be most important to their own morale, and determine to what degree they perceive that these needs are being satisfied.

3) Determine in comparison with the author's 1961 study [8] and other related studies, if there have been any significant shifts in the attitudes or need perceptions of submarine personnel during the last five years.

4) Determine if significant differences in attitudes or need perceptions exist among the various submarine sub-populations of the sample. Specifically, do the men serving in different types of submarines have different attitudes, and different levels of need aspirations and satisfactions? How does rank/rate, marital status, or career status, influence the motivation patterns of submarine personnel?

Research significance. Officers in command positions would generally agree that, "people are our most important resource." Yet, in the practical day-to-day operation of the Navy, our men are considered as bodies filling billets necessary to accomplish

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certain work tasks. However, the required work tasks necessary to effectively run our ships cannot be separated from the individual who performs the tasks. The motivations, experiences, and social interrelations of each man with his family, the Navy, his submarine, and his community, must be considered. Too often those of us in leadership positions have failed to realize that a real possibility exists that the attitudes and motivations that we think our men have do not coincide with the attitudes and motivations that they actually have. Incorrect assumptions about our men, or about their behavior, can lead to results which are the antithesis of those which were predicted or assumed - enlisted proficiency pay being an example.

Measuring attitudes with scientific accuracy is very difficult. The research effort of this study is oriented toward an understanding of the nature and formation of the motivations of submariners, and the factors of the total environment that influence them. Motivations when understood in our men, in the Navy, and on board ship, can lead to better prediction of behavior and the success of short and long-term policies. By discovering attitudes on factors related to the man's job aboard his ship, officers in command can correct certain bad situations and thereby improve the job satisfaction and morale of the men. By knowing what individual attitudes contribute to job satisfaction on submarines, the Submarine Force can apply this knowledge for better selection procedures.

Thus continuing research of this type can be most useful in the retention and personnel management of the men now serving on our submarines, and in the initial screening and selection of submarine candidates.

II. REVIEW OF THE LITERATURE

Author's 1961 study. The author conducted a study in 1961 in partial fulfillment of the requirement for "Qualification of Command of Submarines," [8] concerning submarine motivation. The 1961 study was based on questionnaire replies received from 27 submarine officers, 337 submarine enlisted personnel and 103 surface enlisted personnel.

Both the submarine group and the surface group indicated that the romantic allusion of adventure was the predominate reason for originally joining the Navy (47.9% for submarine, 54.9% for surface). The second most important reason for the submarine group was financial benefits (22.8% versus only 7.9% for the surface group). When asked to rate the reasons why they were in the Navy now, both groups again gave the reasons of financial stability and retirement benefits, with the submarine group mentioning this factor more frequently than the surface group (62.0% for submarine group versus 41.1% for the surface group). The second most important reason given by both groups for being in the Navy now was their liking and satisfaction with their jobs (21% for both groups).

When the career personnel were asked if they regretted their decision to make the Navy a career, almost four times as many men serving in nuclear submarines indicated that they regretted the decision than did the man on diesel-electric submarines (Percentage regretting: diesel-electric - 8.1%; nuclear - 31.2%; surface - 27.0%).

The answers of both groups correlated closely in response to the question of how they rated the feeling of satisfaction that they were receiving from their present assignment. 34.8% of the submariners and 36.2% of the surface sailors indicated that they were very well satisfied with their present job or assignment. When the submarine group was analyzed by career and non-career status, 40.4% of the career group and 27.9% of the non-career group indicated a feeling of greater than satisfactory in their present jobs. The most significant difference in response to this question was between the diesel-electric (SS) group and the nuclear group (SSN/SSBN). While 37.5% of the SS group and 43.2% of the SSN/SSBN groups were more than satisfied with their present assignments, 27% of the SSN/SSBN group considered their jobs aboard ship as less than satisfactory compared to only 7.5% of the SS group.

When the submarine group was asked to rank ten possible reasons for being volunteers for submarine duty, extra pay was by far the greatest single response. Although extra pay was the greatest single reason, it accounted for only one-third of the replies. The SS group considered informal atmosphere (16.8%) as

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the second most important reason for being a submarine volunteer,

while the SSN/SSBN group considered the reason of more competent

personnel (17.2%) as their second choice. 46.8% of the SS group

and 49.8% of the SSN/SSBN group claimed that they would no

longer be volunteers for submarine duty if submarine pay were to

be discontinued. In both the SS group and the SSN/SSBN it was

found that the career designated personnel were those who would

object most strongly to the termination of extra pay for submarine

duty (51.9% of the SS career group and 61.3% of the SSN/SSBN

career group).

When the submarine personnel were asked why they thought

they should get extra incentive pay, the men on the diesel-electric

submarines indicated poor living conditions (40.0%) as the primary

reason. The nuclear group indicated that the extra workload,

responsibility and mental tension were the primary reasons (55.3%).

Only 15.4% of the SS group and 9.7% of the SSN/SSBN group rated

the dangerous environment as being a reason for submarine pay.

In 1961 65-75 per cent of the men serving in each type of

submarine indicated that they preferred duty in that type — they

had no desire to change to another type. Both the SSN and the

SSBN groups indicated that their second choice would be to serve

on SS. The men in the diesel-electric group were asked if they

would object to a transfer to fleet ballistic missile submarine

(SSBN) and were they volunteers for the nuclear power training

program. 57.6% of the career SS and 43.2% of the non-career SS indicated objection to service on a SSBN. 45.7% of the career SS and 65.1% of the non-career SS said they would not volunteer for nuclear power training. The reasons given by the group for these negative attitudes centered about the arduous operating schedule, long hours, and low morale which through hearsay evidence they associated with the nuclear submarine navy. The author concluded that this phenomenon was a "fear of the unknown" by the majority of SS personnel who were satisfied in their present type submarine and who were reluctant to give up their present security for a change to programs about which they had heard so many disagreeable tales.

While the officer sample of the 1961 study was small (N = 26), it is interesting to compare their responses with those of the submarine enlisted group. The submarine officers said they were in the Navy because they liked the type work (67.7%) versus the 62% enlisted who said they were in the Navy for reasons of financial security and retirement benefits. About 6% of the officers indicated that they were receiving less than satisfaction from their present duty assignment compared to the 23% of the enlisted who were less than satisfied. 83% of the officers considered their jobs very satisfactory versus only 35% of the enlisted. 78.9% of the officers stated that they would still be volunteers for submarines even if submarine pay were to be discontinued. Almost 75% of the

officers indicated a desire to serve in nuclear powered submarines and to go into the nuclear power training program.

The Self-Reported Motivational Questionnaire (SMQ). Rubin and Parker (1961) investigated the reliability and validity of an experimental paper-and-pencil test designed to measure certain aspects of the motivation of enlisted volunteers for basic submarine training. [21]

The two authors using a sample of 1249 enlisted men, concluded that the SMQ score was usefully reliable when using Submarine School attrition as the criterion, for predicting success in Enlisted Submarine School - but only for the population sub-group with below average ability. The final rank order of the 1100 Submarine graduates was significantly correlated with the SMQ of the "low" apptitude group.

Use of a Psychiatric Interview to Predict Motivation of Enlisted Men for the Submarine Service. Ninow (1961) conducted psychiatric interviews of 52 enlisted submariners serving on a nuclear submarine and compared the results with the Self-Reported Motivational Questionnaire (SMQ). [17]

Ninow concluded that those attitudinal aspects of motivation pertaining specifically to the hazards involved in submarining are most accurately predictable. Also specific reasons for volunteering for the service seem to be quite predictable. The least predictable items appeared to be related to the degree of ego-involvement of

the man, the satisfactions he experiences, and the self-perceived status associated with his vocational choice.

Comparison of Interviews of Submarine and Surface Personnel. Blumenfeld (1965) conducted a study based on structured interviews of 108 submarine enlisted and 157 surface enlisted. The purpose of the study was to provide information as to what traits, characteristics, needs, or aspirations, or any other dimensions of behavior differentiate the kinds of electronics rating personnel who reenlist in the Submarine Service from the electronics rating personnel who reenlist in surface ships. [3]

Blumenfeld found no really clear-cut differences between the submarine and surface personnel primarily because of the great homogenuity of the groups both within and between. Blumenfeld did report on certain suggestive trends in the data, verbal and numerical, which allow the suggestion of certain subtle differences relating to the character and orientation of the two groups. Both the qualitative and the quantitative data tended to characterize the submarine group as individuals who are more narrow and self-centered in Navy life orientation. He describes this as being "job and boat" oriented. They appeared to be concerned with realistic and materialistic matters, e.g., pay, family life, co-workers; they seem more sure in their goal direction and appear more mature and settled. They appear to identify with a smaller organization.

The study tended to characterize the surface group as individuals who are more broad and less materially self-centered in Navy life orientation. He calls this "institution" oriented. They appeared to be concerned with adventurous and idealistic matters, e.g., travel and adventure, patriotism and duty; they seemed less sure in their goal direction and appeared less mature and settled. They appeared to identify with the "larger" institution.

These differences were also apparent in the writer's 1961 study (Draddy, 1961).

Some Reasons Why Men Elect To Join The Submarine Service

Blumenfeld (1965) prepared a report based on the interviews of 60 first-enlistment electronics-type men in the Submarine Force. [4] The study concluded that pay was the primary reason why the 60 men had elected to join the submarine service. Secondary reasons also given with relative frequency included adventure-travel-glamour, co-workers, prestige, living conditions, responsibility and authority, unpredictability, advancement, equipment, and work hours-watches-liberty. This concludes that the submarine service was chosen because it had associated with it the image of the "good life."

Blumenfeld reported the unexpected finding that the current first-enlistement group differed greatly from a comparable reenlistment group in that the first enlistement group talked much more about adventure-travel-glamour whereas with the referenced

reenlistment group, these matters were of little, almost negative, concern. As with the reenlistment group, the current group was small group, i.e., "job and boat" oriented, in their approach to naval service.

The report found that the popular image of the submarine service induced by books, TV, recruiters, and friends was clearly demonstrated by the responses. Thus, while the effectiveness of these channels is apparent, their accuracy is problematic, and Blumenfeld suggests that for those whose image expectation is essentially matched, reenlistment occurs.

A Study of Motivations for Enlisting in the Navy. Connery and Waite (1965) reported the responses of 2000 candidates for the Nuclear Power Field to the question, "why did you enlist in the Navy." [7] 35% of the candidates gave as their reason "to get an education." This response which was by far the most popular choice, was mentioned three times more frequently than the second most popular choice, "to serve my country." The authors draw the conclusion that at entrance into the naval service a talented portion of the recruit population, as represented by this Nuclear Power Field sample, is not a naval career oriented group. Since career and possible-career oriented recruits are in a distinct minority, it is not surprising that large losses to the naval service occur in the group at end of first enlistments.

A Follow-up Study of Basic Enlisted Submarine School

Graduates. Parker and Ninow (1962) conducted a two phase study

for judging success of Sub School graduates. 18   Phase I (N = 37)

began four months after the completion of Submarine School, Phase II

(N = 29) four months after Phase I. One unexpected sidelight of

this study were some attitude findings concerning the Nuclear Power

Training Program and the FBM Training Program. In phase I, 25%

said they would apply for nuclear training or already had, 17% were

undecided, and 36% would not apply. At the end of Phase II, 4-6

months later, 13%, would apply, 13% were undecided, and 74%

would not apply. Somewhat the same pattern was obtained for the

FBM program although to a much lesser degree.

Herzberg's theory of job "satisfiers" and "dissatisfiers."

Herzberg, Mausner, and Snyderman (1959) found that the

determinants of job satisfaction ("satisfiers") were qualitatively

different from the determinants of job dissatisfaction ("dissatisfiers").

13   They reported that the three factors of work itself,

responsibility, and advancement stand out strongly as the major

factors involved in producing high job attitudes. Their role in

producing poor job attitudes is by contrast extremely small. To

the contrary, organizational policy and administration, supervision,

and working conditions represent the major job dissatisfiers with

little ability to affect job attitudes in a positive direction. Poor

working conditions, bad organizational policies and administration,

and bad supervision will lead to job dissatisfaction. Good policies, good administration, good supervision, and good working conditions will <u>not</u> lead to positive job attitudes. Recognition, achievement, interesting work, responsibility, and advancement all lead to positive job attitudes. Their absence will much less frequently lead to job dissatisfaction. Thus, it was found that salary has more potency as a job dissatisfier than as a job satisfier.

The authors describe the dissatisfiers as factors of hygiene. The hygiene factors act in a manner similar to the principles of medical hygiene. Hygiene operates to remove health hazards from the environment; it is not a curative but rather a preventative. Motivation is described as the factors that lead to positive job attitudes. They do so because they satisfy the individual's need for self-actualization in his work. Thus, management policies that concentrate on only the hygiene factors such as pay and physical working conditions can only act in a preventative manner. The fewer the opportunities for the "motivators" to appear, the greater must be the hygiene offered to make the work tolerable. On the other hand, a man who finds his job challenging, exciting, and satisfying will often tolerate poor "hygienic" conditions, such as low pay or difficult supervisors. The authors note that where morale surveys have differentiated between dissatisfaction with the amount of salary as opposed to the equity of salary, the latter is usually the source of the greater dissatisfaction.

<u>Maslow's theory of motivation</u>. Abraham Maslow (1954) developed a theory of motivation according to a hierachy of prepotency. [16]

Man's needs are organized in a series of levels - a hierarcy of importance. From the lowest, but first in importance when they are thwarted, are his <u>physiological needs</u>. Next in order are his safety needs, social needs, esteem needs, and self-fulfillment needs. Man lives by bread alone when there is no bread. But when there is plenty of bread at once other and higher needs emerge and these, rather than physiological hungers, dominate the motivations of the individual. When these latter are satisfied, new and higher needs emerge, and so on.

The second level of needs are called <u>safety needs</u>. They are needs for protection against danger, threat, deprivation. These needs are particularly important when a man feels threatened or dependent - at the mercy of a capricious or erratic superior.

When the two basic needs above are satisfied the <u>social needs</u> become the important motivators of behavior. These are the needs for belonging, association, acceptance by his shipmates, giving and receiving friendship and love.

The <u>esteem needs</u> are among the most important to the American of the Twentieth Century. They are the needs for achievement, for adequacy, for mastery and competence, for confidence in the face of the world. They also include the desire for prestige, status,

recognition, attention, importance, or appreciation. These needs

are almost infinite and are rarely completely satisfied. A large

autocratic organization is particularly well suited to effectively

frustrate the esteem needs of the men at the lower level.

The highest need, seldom achieved, is the need for self-

actualization. Most people's energies are so diverted towards

the satisfactions of the other lower-level needs, that this need is

rarely satisfied.

Perceived need satisfactions in bottom and middle management

jobs. Porter (1961) conducted a motivational study with a

questionnaire vehicle constructed by grouping motives or needs

according to the Maslow hierarchy of need satisfactions. [19]

Bottom level management personnel were defined as those at the

lowest level of management - generally first-line supervisors.

Middle level was defined as those positions above the first level

of supervision, but below the vice-presidential or major department-

head-level.

The study found that the vertical location of management

positions appears to be an important variable in determining the

extent to which psychological needs are fulfilled. The greatest

differences in the frequency of need fulfillment between the two

groups occurred in the esteem, security, and autonomy need areas.

These needs were more often satisfied in middle rather than bottom

management jobs. The higher order needs (social, esteem,

autonomy, self-fulfillment) are relatively the least satisfied needs in both bottom and middle management.

Perceived importance of needs as a function of job level. Porter (1963) using the same techniques as above, investigated perceived need importance, rather than need satisfaction. [20] He found that higher level managers tend to regard the autonomy and self-fulfillment needs as more important to them than did the lower level managers. The five different levels studied tended to be similar in the relative ranks that they gave to the importance of the five need categories. Porter concluded that since the self-fulfillment and autonomy needs were perceived to be the most important and the least satisfied by all the management levels, these needs are probably the most critical areas for organizations to consider in their relations with their supervisory personnel.

CHAPTER II

METHOD

A questionnaire answered by officers and men serving on board
United States Navy submarines was the primary source of data for
this study.

I. DESCRIPTION OF THE QUESTIONNAIRE

The questionnaire (Appendix A) was developed from three
sources: questions used in the author's 1961 study; questions
grouping motives or needs according to a hierarchy of ascending
potency (Maslow) [16] ; and questions designed to elicit specific
information peculiar to the sample under consideration.

The grouping of certain questions according to the Maslow
hierarchy of needs was used primarily because it is a useful,
simple method of overcoming the continued controversey of how to
name and classify various motives and needs. The conceptualiza-
tion of a hierarchy of need satisfaction has been used in one form
or another by such writers as Argyris, 1957; Davis, 1957; Haire,
1956; Vitelis, 1953. [19]

The questionnaire was divided into five areas of interest. The
first part was for the purpose of ascertaining background
information such as the respondent's rank or rate, age, educational
background, submarine experience, marital status, career status,
and type submarine on which currently serving. The second section
was oriented toward finding what motivated the respondent for

submarine duty. This section contained some of the same questions asked in the 1961 study in the hope of determining any significant trend differences between this study and the 1961 study. The third section of the questionnaire was designed to obtain a measure of the degree of the subject's present motivational patterns and feelings of satisfaction in his present environment.

Seven questions were concerned with the safety or security needs, three questions concerning the social needs, seven questions on the esteem needs, three questions on the autonomy needs, and two questions on the self-fulfillment or self-actualization needs. The inclusion of the autonomy needs, are ones which under the Maslow system would be included in the esteem category, but which Porter [19] inserted in the hierarchial order of needs between the esteem category and the self-actualization category, to which they have some relation. The author assigned certain questions not included by Porter, but considered by the author pertinent to the submarine environment, to the five categories. Thus, for example, financial security has been assigned to the security needs, pay for the job to the esteem needs, and housing of dependents to the security needs.

The fourth part of the questionnaire asked the subjects to choose from part three (basic and higher-order need satisfactions) the three most important items (questions) which he believed were most important to the maintenance of his own personal morale.

Thus while part three tried to ascertain a measure of the subject's present level of need satisfaction, part four tried to ascertain the needs that submarine personnel consider to be most important, regardless of the level of need satisfaction perceived as being presently attained.

The final section of the questionnaire, which was optional, allowed each man to express in his own words the factors which he believed had an effect or bearing on the motivations and morale of submarine personnel. It was hoped that this section would be utilized by those who felt that the semi-structured objective type questions used in the proceeding sections, were too restrictive. Thus the subject's were given the opportunity to express in their own words their feelings concerning submarine motivation.

The questions were to be answered by writing in spaces provided, appropriate code numbers that were assigned to each question or group of questions. The majority of the questions in parts two and three were to be rated by a seven number scale indicating the degree of effect or satisfaction that each question evoked to the respondent, where "1" represented no effect or satisfaction and "7" represented very great effect or satisfaction. This latter type of question represented 52 of the total 68 objective type questions. The use of such type structured questions was necessary to quantify the answers and facilitate computer application in the analysis of the questionnaire.

II. DESCRIPTION OF THE SAMPLE

With the approval of Commander Submarine Force, U. S. Atlantic Fleet, and Commander Submarine Force, U. S. Pacific Fleet, the questionnaires were sent to fifty submarines, thirty in the Atlantic Fleet and twenty in the Pacific Fleet. Twenty-four sets were sent to diesel-electric submarines (SS), eighteen sets to fleet ballistic missile submarines (SSBN), and eight sets to nuclear attack submarines (SSN). This ratio approximates the distribution of the three types of submarines in the Navy (considering that there are two complete crews per SSBN). Each Commanding Officer was requested to administer the questionnaires to one duty section of his crew, either an inport or at-sea duty section. This method guaranteed a random sampling of the men on each submarine by experience, rate, marital and career status. The Commanding Officer was also asked to administer the questionnaire to two or three randomly selected officers. The officer sample was included primarily to compare their responses with those of the enlisted sample. A total of 1758 questionnaires were mailed out, 33 to each SS, 35 to each SSN, and 40 to each SSBN crew. Appendix C lists the submarines comprising the sample.

III. ANALYSIS PROCEDURE

The mean values obtained from the sample for questions 20-51 were used as the basis for the comparison and ranking of the answers (these questions were rated on a scale from 1 to 7).

Tests of significance between the values of replies within a sample

and between samples were made using the t-distribution, one-tail

tests, even though in most cases because of the large sample size,

the t-distribution approximated the Z (normal) distribution. The

estimated standard error or the difference between two sample

means (s$_{\bar{x}_1}$ - s$_{\bar{x}_2}$) was computed by the formula, $S\bar{x}_1 - S\bar{x}_2 = \sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}$

where "s" is the sample deviation and "n" is the sample size.

Differences in means beyond the .05 level were considered to be

statistically significant. The product moment coefficient of

correlation (Rho) was used as appropriate to establish the degree

of linear relationship between sets of any two variables. Table VI

of the excellent work by Edwards [10] was used to deter-

significant values of Rho (test of the null hypothesis that the

population correlation is zero). Examples of the Fortran programs

developed by the author to assist in the questionnaire analysis are

included as Appendix D.

Part five of the questionnaire (subjective section) was analyzed

by computing the frequency of the most recurring themes found in the

officer and the enlisted sample.

IV. LIMITATIONS

The scientific study of human motivation is very recent. There

is no single generally accepted theory of motivation. Maslow's

theory is a convenient but still hypothetical one. The theories of

motivation range from the free will concepts of Plato and Aristotle,

through the instinct theories of Freud and McDougall, the drive

theories of Woodworth and Cannon, and the pain and pleasure

theories of Young and McClelland.

Besides the various theories on the nature of motivation, there

is recurrent controversy over how motives and attitudes can be

measured. There is general agreement that motives and attitudes

cannot be directly observed, but must be inferred from overt

behavior, both verbal and non-verbal. There is a great variety

of measures of job attitudes. Generally, the attempt to identify

job attitudes has been done in three ways. In the first method,

which is the method used in this study, the subject is asked to

rate or rank a given set of factors as to desirability. The second

method has the subject give a subjective type answer about how

he likes his job. The third method uses multiple-item inventories

which result in a more indirect method of assessing attitudes. [13]

Whether verbally expressed opinions can be regarded as

indicators of "real" attitudes has frequently been questioned. This

problem concerns the relationship between verbal and non-verbal

overt behavior. In other words, does the individual suit his

actions to his words - or to his attitude scale score? Other

methodological problems center about the formulation of the questions,

the administration of the survey, and the procurement of an adequate

sampling of the population. [1] Additionally, the validation of

attitude measurements presents a difficult problem. In most

practical situations, the validity concept can be reduced to a
question of how far one can generalize from the test results. [1]
The use of only one measure of job attitudes, such as the semi-
structured type of questions used in this study, is acceptable if the
study is only of an exploratory nature. [6]

This study does not proport to be able to generalize from the
questions used, an over-all measure of motivation or need
satisfaction of the submarine sample. Rather the study seeks to
find the attitudes of the sample, and of contrasted groups within
the sample, to specific questions of interest to those in positions
of command in the Navy. One purpose is to evaluate how the men
answer the questions in relation to how the senior members of the
Submarine Force think they should answer them. Essentially, then
this study is a systematic exploration of the verbally reported
replies.

The validity of the study rests upon its face validity, and in
certain cases, contrasted group validity. Face validity refers,
not to what the questions necessarily measure, but to what they
appear to measure – do the questions seem to be relevent to the
subject when viewed by those who answer them and those who
interpret the results. Validation by the method of contrasted groups
involves a composite criterion which reflects the cumulative and
uncontrolled selective influences of every day life. Thus for example
when comparing the submarine career group with the non-career

group the assumption would be that the career group would be more satisfied in the Navy than the non-career group. If the study shows this to be so then a measure of validation is present.

Reliability of this study will be the consistency with which it measures whatever it proports to measure. Thus, if a high correlation exists among the relative ranking of answers to questions given by such homogeneous groups as men serving on the three types of submarines, a measure of reliability of the questionnaire must be assumed.

CHAPTER III

RESULTS

The sample consisted of 1069 questionnaires received from 44 of the 50 submarines requested to participate in the study. These replies were received from 24 diesel-electric submarines (SS), 5 nuclear attack submarines (SSN), and 15 crews of fleet ballistic missile submarines (SSBN). At the time of the analysis, questionnaires had been received from all participating SS, 15 out of the 18 participating SSBN, and 5 out of the 8 participating SSN. The distribution of the questionnaires received from the submarines was as follows: SS 45.3%, SSN 12.0%, and SSBN 42.7%.

I. BACKGROUND STATISTICAL DATA ON SAMPLE

Officer Sample (N = 120).

Average age			28.3 years
Average education			16.1 years
Average active duty			6.9 years
Average time in submarines			4.3 years
Career	76(63%)	Non-career	44 (37%)
Married	95(79%)	Single	25 (21%)

Distribution by type submarine

SS	SSN	SSBN
70	10	40

Distribution by rank

ENS	LTJG	LT	LCDR	CDR	CAPT
10	33	61	13	3	1

Enlisted Sample (N = 949).

Average age	25.6 years
Average education	12.1 years
Average active duty	7.1 years
Average time in submarines	4.5 years
Career 577(58%) Non-career	372(42%)
Married 563(57%) Single	386(43%)

Enlisted data matrix by submarine type.

DATA	SS	SSN	SSBN
Age	25.6	25.1	25.7
Education	12.1	12.1	12.0
Active duty	7.0	6.5	7.2
Sub. duty	4.6	4.3	4.5
Married	232	65	266
Single	181	53	152
Career	193	73	311
Non-career	220	45	107
Non-rated	52	19	39
Petty officer	314	82	321
Chief P. O.	47	17	58
Sample size (N)	413	118	418

Enlisted data matrix by rate.

DATA	NON-RATED	PETTY OFF.	C.P.O.
Sample size (N)	110	717	122
Age	22.4	24.7	33.6
Education	11.8	12.1	12.1
Active duty	4.0	6.1	14.8
Sub. duty	2.9	3.9	9.4
Married	45	415	103
Single	65	302	19
Career	24	446	107
Non-career	86	271	15

II. MOTIVATION FOR A CAREER IN THE NAVY

Using a scale ranging from "1" to "7" each subject was asked to rate each of nine possible reasons according to the effect that the reason had on why he was now in the Navy. (See Appendix A, Q. 20)

Comparison of enlisted and officer samples (Table II-1). The correlation between the officer and enlisted groups is low and the differences in values assigned to eight of the nine reasons is statistically significant. The officers appear to be highly job oriented (interesting duties, enjoy the job, enjoy one's co-workers). Education and the social climate of the submarine environment are considered most important by the enlisted men. Interestingly enough, the financial motivations for being in the Navy are ranked about the

same by both groups and are near the bottom of both lists.

TABLE II-1

MOTIVATION FOR THE NAVY

OFFICER (N = 120) & ENLISTED (N = 947)

CONTENT	OFFICER Mean	Rank	ENLISTED Mean	Rank
Patriotism	4.64*	4	4.39*	3
Enlistment not expired	2.40***	9	3.80***	7
Financial security	3.78	8	3.74	8
Enjoy my job	5.16***	2	4.22***	4
Good friends/shipmates	4.97*	3	4.58*	2
Retirement benefits	4.17***	5	3.82***	6
Interesting duties	5.17***	1	3.90***	5
Adventure	4.12***	6	3.48***	9
Education	3.92***	7	4.59***	1

Rho = .377

*Statistically significant beyond the .05 level

***Statistically significant beyond the .005 level

Comparison of enlisted career and non-career (Table II-2). Not surprisingly, there is a marked difference in attitude between the career and the non-career group. A negative correlation exists between the values each group has assigned to the reasons for being in the Navy. A very significant (the .005 level) difference exists in the values given to each reason, except for patriotism, education, and good friends and shipmates. The career group rates financial security, job enjoyment, retirement benefits, and interesting duties very much higher than the non-career group. Enlistment-has-not-yet-expired, and adventure, are the only two reasons non-career men rate higher than the career group. Note that for the total enlisted group, retirement benefits was ranked only sixth in importance (Table II-1), while the career group ranked it first. Table II-2 shows the cause to be the extremely low values given retirement benefits by the non-career group. The same logic applies to the enjoy my job question.

Comparison of enlisted married and single (Table II-3). The correlation between the answers of the married/single groups is zero. The married group correlates more closely with the career group, than with the single group (about two-thirds of the married group is career). The married man values patriotism, job satisfaction, and retirement benefits, significantly more than does the single man. Only for adventure and enlistment-has-not-expired does the single man give higher ratings than the married man.

TABLE II-2

MOTIVATION FOR THE NAVY

ENLISTED CAREER (N = 577) & NON-CAREER (N = 372)

CONTENT	CAREER		NON-CAREER	
	Mean	Rank	Mean	Rank
Patriotism	4.52	5	4.20	4
Enlistment not expired	3.10***	9	4.88***	1
Financial security	4.40***	6	2.73***	8
Enjoy my job	4.69***	2	3.49***	7
Good friends/shipmates	4.62	4	4.54	2
Retirement benefits	4.80***	1	2.30***	9
Interesting duties	4.04***	7	3.49***	6
Adventure	3.31***	8	3.75***	5
Education	4.66	3	4.49	3

Rho = -.381

***Statistically significant beyond the .005 level

TABLE II-3

MOTIVATION FOR THE NAVY

MARRIED (N = 563)   &   SINGLE (N = 386)

CONTENT	MARRIED		SINGLE	
	Mean	Rank	Mean	Rank
Patriotism	4.49*	3	4.24*	4
Enlistment not expired	3.40***	8	4.42***	3
Financial security	4.18	6	3.09	8
Enjoy my job	4.45***	5	3.87***	6
Good friends/shipmates	4.54	2	4.65	2
Retirement benefits	4.49***	4	2.83***	9
Interesting duties	3.91	7	3.89	5
Adventure	3.31***	9	3.74***	7
Education	4.55	1	4.67	1

Rho = .026

*Statistically significant beyond the .05 level

***Statistically significant beyond the .005 level

Comparison of diesel electric (SS), nuclear attack (SSN), and fleet ballistic missile (SSBN) submarines (Table II-4). Considerable similarity of attitudes among the submarine types is indicated since the correlations of values assigned by the three groups is high and statistically significant. The correlation between the SS and SSN is significantly greater (.05 level) than between the SS and SSBN or SSN and SSBN.

Both the SSN and SSBN rate education as the most important motivator for being in the Navy, and the SSBN rates education significantly higher than the SSN. The SS group rates good friends and shipmates as the most important influence, and rates it significantly higher than do the others. The three groups place retirement and financial security near the bottom of the list, but the SSBN rates these significantly higher than either the SS or SSN. It is interesting to note that the SSN rates enlistment-has-not-yet-expired significantly higher than does the SS group in spite of the fact that the SS group has a larger proportion of non-career men than does the SSN group.

Comparison of non-rated, petty officer and chief petty officer. A fairly high correlation exists between the non-rated and the petty officer, but none exists between the petty officer and the chief petty officer. The non-rated and petty officer groups most value education and good friends/shipmates. The CPO's most important indicated motivators are retirement benefits and enjoyment of the

job. Only on good friends/shipmates and education is there significant agreement with the other two groups. The non-rated group, which is younger and newer to the Navy, rates adventure the highest of the three groups and rates retirement benefits, financial security, and enjoy-my-job, the lowest of the three groups.

Table II-6 shows the much closer correlation of the chief petty officer sample to the officer sample. The CPO attaches more importance to financial security than do the officers. On the other hand, the officers rate interesting duties and adventure significantly higher than do the CPO.

TABLE II-4

MOTIVATION FOR THE NAVY

DIESEL-ELECTRIC (SS) (N = 413), NUCLEAR ATTACK (SSN) (N = 118), & FLEET BALLISTIC (SSBN) (N = 418)

CONTENT	SS Mean	Rank	SSN Mean	Rank	SSBN Mean	Rank
Patriotism	4.42	2	4.29	3	4.40	3
Enlistment not expired	3.81*	6	4.18*	4	3.67***	8
Financial security	3.61***	9	3.29	8	3.97***	6
Enjoy my job	4.07***	4	3.84	5	4.48***	4
Good friends/shipmates	4.69*	1	4.44	2	4.53*	2
Retirement benefits	3.70*	8	3.27	9	4.03*	5
Interesting duties	3.97	5	3.59	6	3.92	7
Adventure	3.79***	7	3.35	7	3.24***	9
Education	4.23***	3	4.57	1	4.99***	1

Rho (SS VS. SSBN) = .655 (Significant at .05 level)

Rho (SSN VS. SSBN) = .684 (Significant at .025 level)

Rho (SS VS. SSN) = .810 (Significant at .005 level)

*Statistically significant beyond the .05 level

***Statistically significant beyond the .005 level

TABLE II-5

MOTIVATION FOR THE NAVY

NON-RATED (N = 110), PETTY OFFICER (N = 717), CHIEF PETTY OFFICER (N = 122)

CONTENT	NON-RATED		PETTY OFFICER		C.P.O.	
	Mean	Rank	Mean	Rank	Mean	Rank
Patriotism	4.27	3	4.33	3	4.87***	4
Enlistment not expired	3.96	5	4.07	5	2.12***	9
Financial security	3.22*	8	3.67*	7	4.64***	5
Enjoy my job	3.42***	7	4.16***	4	5.24***	2
Good friends/shipmates	4.74	1	4.51	2	4.88	3
Retirement benefits	2.92***	9	3.64***	8	5.68***	1
Interesting duties	3.86	6	3.79	6	4.58***	6
Adventure	4.02***	4	3.43	9	3.33	8
Education	4.51	2	4.67*	1	4.23	7

Rho (Non-rated vs. Petty officer) = .682**

Rho (Petty officer vs. C.P.O.) = .090

*Statistically significant beyond the .05 level

**Statistically significant beyond the .025 level

***Statistically significant beyond the .005 level

TABLE II-6

MOTIVATION FOR THE NAVY

CHIEF PETTY OFFICER (N = 122), OFFICER (N = 120)

CONTENT	CPO		OFFICERS	
	Mean	Rank	Mean	Rank
Patriotism	4.87	4	4.64	4
Enlistment not expired	2.12	9	2.40	9
Financial security	4.64***	5	3.78***	8
Enjoy my job	5.24	2	5.16	2
Good friends/shipmates	4.88	3	4.97	3
Retirement benefits	5.68***	1	4.17***	5
Interesting duties	4.58***	6	5.17***	1
Adventure	3.33***	8	4.12***	6
Education	4.23	7	3.92	7

Rho = .752*

*Statistically significant beyond the .05 level

***Statistically significant beyond the .005 level

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Attitude of career personnel concerning their choice of the Navy as a career. The career designated personnel were asked if they regretted their decision to make the Navy a career. The answers are summarized below:

	OFFICER (N = 76)	ENLISTED (N = 577)
YES REGRET	4.1%	17.3%
NO REGRET	77.0%	58.6%
UNDECIDED	18.9%	24.1%

	MARRIED (N = 427)	SINGLE (N = 136)
YES REGRET	15.6%	21.8%
NO REGRET	62.4%	47.2%
UNDECIDED	22.0%	31.0%

	SS (N = 193)	SSN (N = 73)	SSBN (N = 311)
YES REGRET	12.0%	31.1%	18.0%
NO REGRET	63.6%	48.7%	58.2%
UNDECIDED	24.4%	20.2%	23.8%

	NON-RATED (N=24)	P.O. (N=446)	CPO (N=107)
YES REGRET	8.3%	19.4%	10.0%
NO REGRET	62.5%	54.2%	76.0%
UNDECIDED	29.2%	26.4%	14.0%

Officers are the most satisfied with their decision to make the Navy a career. Married men are more contented than single men, and the SS personnel are more contented than either the SSBN or SSN

personnel. As a group, the SSN has the largest number of men who regret their decision to make the Navy a career.

Summary. Wide variance was found as to what motivations submarine personnel consider important for being in the Navy. Not only were expected variances found between officers and enlisted, but also within the various enlisted sub-populations. Table II-7 gives a rank order summary of the results of this portion of the study.

TABLE II-7

RANK ORDER SUMMARY OF REASONS GIVEN FOR BEING IN THE NAVY AT THIS TIME

CONTENT	Officer	CPO	P.O.	Non-rated	Career	Non-career	Married	Single	SS	SSN	SSBN
Patriotism	4	4	3	3	5	4	3	4	2	3	3
Enlistment not expired	9	9	5	5	9	①	8	3	6	4	8
Financial security	8	5	7	8	6	8	6	8	9	8	6
Enjoy my job	2	2	4	7	2	7	5	6	4	5	4
Good friends/shipmates	3	3	2	①	4	2	2	2	①	2	2
Retirement benefits	5	①	8	9	①	9	4	9	8	9	5
Interesting duties	①	6	6	6	7	6	7	5	5	6	7
Adventure	6	8	9	4	8	5	9	7	7	7	9
Education	7	7	①	2	3	3	①	①	3	①	①

The career and the chief petty officer groups indicated primary interest in the retirement benefits of a career in the Navy. Education was ranked first by the petty officer, married, single, and SSBN groups. Only the officers considered interesting duties of significant value and they rated that factor first. Good friends/shipmates was high on all lists. Being in the Navy for reasons of financial security was rated as a low motivator by all the groups.

III. MOTIVATION FOR CHOOSING SUBMARINE DUTY

Using a scale varying from one to seven the subjects were asked to rate eight given reasons as to why they originally volunteered for submarine duty, and to rate the same eight reasons as to why they are still volunteers for submarine duty (Appendix A, Q21 and 22).

Officers (Table III-1). Significant changes can be seen to have occurred in the officer's attitudes toward the excitement of submarine operations, the concept of the submarine service as an "elite" outfit, and extra pay for submarine duty. Submarine pay has become significantly more important to the officers after they have had a period of submarine service. The greatest indicated shift in attitudes concerns the type of operations. Exciting operations dropped from third ranked to seventh ranked after an officer's exposure to submarine duty.

Enlisted (Table III-2). There have been significant shifts in the values assigned by the enlisted men for originally coming into

TABLE III-1

MOTIVATION FOR SUBMARINE DUTY
OFFICER (N = 120)

CONTENT	ORIGINALLY		NOW	
	Mean	Rank	Mean	Rank
Extra pay	4.60***	4	5.04***	2
Greater responsibility	5.05	2	4.97	3
Informal atmosphere	4.35	7	4.12	4
More competent personnel	5.49	1	5.31	1
Greater advancement	3.32	8	3.05	8
Join an "elite" outfit	4.55***	5	3.99***	6
Up & coming branch	4.46*	6	4.02*	5
Exciting operations	4.61***	3	3.69***	7

Rho = .826**

*Statistically significant beyond the .05 level

**Statistically significant beyond the .025 level

***Statistically significant beyond the .005 level

TABLE III-2

MOTIVATION FOR SUBMARINE DUTY
ENLISTED (N = 949)

CONTENT	ORIGINALLY Mean	Rank	NOW Mean	Rank
Extra pay	5.53***	1	5.93***	1
Greater responsibility	4.00	6	4.07	4
Informal atmosphere	5.00***	3	4.75***	3
More competent personnel	5.08***	2	4.81***	2
Greater advancement	3.92*	8	3.76***	6
Join an "elite" outfit	4.72***	4	4.05***	5
Up & coming branch	4.14***	5	3.73***	7
Exciting operations	3.98***	7	3.16***	8

Rho = .911***

*Statistically significant beyond the .05 level

*** Statistically significant beyond the .005 level.

submarines and staying in submarines. The importance of submarine pay has greatly increased while values given to competent personnel an elite outfit, up and coming branch, and exciting operations have significantly decreased.

Officer-enlisted comparison (Table III-3). When the officer and enlisted samples are compared, as to what currently motivates the groups for submarine duty, it is seen that the values assigned are significantly different for seven of the eight given reasons. Officers rate responsibility, more competent personnel, prestige, more promising future and type of operations, significantly higher than do the enlisted men. Enlisted men consider the extra pay, informal atmosphere, and greater advancement as more important motivators than do the officers.

Comparison of career and non-career (TableIII-4). The career and non-career groups are closely correlated (.955) as to their choice of reasons for being volunteers for the submarine service. Both rank the extra submarine pay as the most important reason, although the career group assigns it a greater weight. The non-career group values informal atmosphere to a greater degree, and both groups rank exciting operations at the bottom of the list.

Comparison of married and single (Tables III-5A, III-5B). The married/single group follows the pattern of the career/non-career with close correlation of the relative rankings of reasons for originally joining the service and for remaining volunteers. But

TABLE III-3

PRESENT MOTIVATION FOR SUBMARINE DUTY
OFFICER (N = 120)　　　　ENLISTED (N = 949)

CONTENT	OFFICER		ENLISTED	
	Mean	Rank	Mean	Rank
Extra pay	5.04***	2	5.93***	1
Greater responsibility	4.97***	3	4.07***	4
Informal atmosphere	4.12***	4	4.75***	3
More competent personnel	5.31***	1	4.81***	2
Greater advancement	3.05***	8	3.76***	6
Join an "elite" outfit	3.99	6	4.05	5
Up & coming branch	4.02***	5	3.73***	7
Exciting operations	3.69***	7	3.16***	8

Rho = .667*

*Statistically significant beyond the .05 level

***Statistically significant beyond the .005 level

TABLE III-4

PRESENT MOTIVATION FOR SUBMARINE DUTY
ENLISTED CAREER (N = 577), NON-CAREER (N = 372)

CONTENT	CAREER		NON-CAREER	
	Mean	Rank	Mean	Rank
Extra pay	6.00***	1	5.44***	1
Greater responsibility	4.21*	4	3.87*	6
Informal atmosphere	4.57***	3	5.02***	2
More competent personnel	4.81	2	4.80	3
Greater advancement	3.66*	7	3.97*	5
Join an "elite" outfit	3.96	5	4.19	4
Up & coming branch	3.72	6	3.75	7
Exciting operations	3.04*	8	3.33*	8

Rho = .955***

*Statistically significant beyond the .05 level

***Statistically significant beyond the .005 level

TABLE III-5A

MOTIVATION FOR SUBMARINE DUTY
ENLISTED MARRIED (N = 563)

CONTENT	ORIGINALLY		NOW	
	Mean	Rank	Mean	Rank
Extra pay	5.61***	1	6.01***	1
Greater responsibility	4.03	6	3.96	4
Informal atmosphere	4.87**	3	4.60**	3
More competent personnel	5.04***	2	4.72***	2
Greater advancement	3.75	8	3.61	7
Join an "elite" outfit	4.71	4	4.74	5
Up & coming branch	4.05***	5	3.69***	6
Exciting operations	3.90	7	4.09	8

Rho = .945***

**Statistically significant beyond the .025 level

***Statistically significant beyond the .005 level

TABLE III-5B

MOTIVATION FOR SUBMARINE DUTY
ENLISTED SINGLE (N = 386)

CONTENT	ORIGINALLY		NOW	
	Mean	Rank	Mean	Rank
Extra pay	5.40***	1	5.77***	1
Greater responsibility	3.96	8	4.00	6
Informal atmosphere	5.19**	2	4.96**	2
More competent personnel	5.13***	3	4.92***	3
Greater advancement	4.21	6	4.01	5
Join an "elite" outfit	4.74***	4	4.17***	4
Up & coming branch	4.28***	5	3.81***	7
Exciting operations	4.09***	7	3.31***	8

Rho = .913***

**Statistically significant beyond the .025 level

***Statistically significant beyond the .005 level

there have been significant shifts in the absolute values assigned to certain of the reasons. Thus, the value assigned to join-an-elite-outfit dropped in both cases after a period of submarine service. As in the case of the other enlisted groups compared, extra pay was weighed significantly higher after submarine service than before.

Comparison of diesel-electric (SS), nuclear attack (SSN), and fleet ballistic missile (SSBN) groups (Tables III-6A, III-6B, III-6C, III-6D). Submarine pay is the greatest single motivator both originally and now, for the three types of submarines. Join an elite outfit, and up-and-coming-branch, are significantly down in each type. Exciting type operations has decreased in value, in the three types with the largest decreases occurring in the SSN and SSBN groups.

Table III-6D compares the present motivational patterns of the three groups towards submarine duty. The correlation between the SS and SSBN groups (.954) is significantly (.05 level) higher than the correlations between the SSN and the SSBN (.872). Comparison of the SS group and the SSBN group shows that only two of the eight values differ statistically from one another. These are informal atmosphere, which is lower on the SSBN, and exciting type operations, which is very much lower on the SSBN.

That the SS group correlates more closely with the SSBN than the SSN is somewhat surprising, considering the different missions of the two types. Even more surprising, Table III-6D reveals that

TABLE III-6A

MOTIVATION FOR SUBMARINE DUTY

DIESEL ELECTRIC (N = 413)

CONTENT	ORIGINALLY		NOW	
	Mean	Rank	Mean	Rank
Extra pay	5.50***	1	5.88***	1
Greater responsibilities	3.99*	6	4.12*	5
Informal atmosphere	5.11	2	4.99	2
More competent personnel	4.99*	3	4.75*	3
Greater advancement	3.82	8	3.67	7
Join an "elite" outfit	4.83***	4	4.27***	4
Up & coming branch	4.05**	5	3.69**	6
Exciting operations	3.86***	7	3.40***	8

Rho = .943***

*Statistically significant beyond the .05 level

***Statistically significant beyond the .005 level

TABLE III-6B

MOTIVATION FOR SUBMARINE DUTY
NUCLEAR ATTACK (N = 118)

CONTENT	ORIGINALLY		NOW	
	Mean	Rank	Mean	Rank
Extra pay	5.31*	1	5.71*	1
Greater responsibility	3.82	7	3.53	5
Informal atmosphere	4.88***	3	4.08***	3
More competent personnel	4.92	2	4.59	2
Greater advancement	3.77	8	3.82	4
Join an "elite" outfit	4.34***	4	3.31***	8
Up & coming branch	4.08**	6	3.46**	6
Exciting operations	4.12***	5	3.37***	7

Rho = .826**

*Statistically significant beyond the .05 level

**Statistically significant beyond the .025 level

***Statistically significant beyond the .005 level

TABLE III-6C

MOTIVATION FOR SUBMARINE DUTY
FLEET BALLISTIC MISSILE (N = 418)

CONTENT	ORIGINALLY Mean	Rank	NOW Mean	Rank
Extra pay	5.58**	1	5.97**	1
Greater responsibility	4.04	8	4.14	4
Informal atmosphere	4.92**	3	4.64**	3
More competent personnel	5.19**	2	4.91**	2
Greater advancement	4.06	7	3.86	7
Join an "elite" outfit	4.73**	4	4.37**	5
Up & coming branch	4.30***	5	3.90***	6
Exciting operations	4.10	6	2.95	8

Rho = .897***

**Statistically significant beyond the .025 level

***Statistically significant beyond the .005 level

TABLE III-6D

PRESENT MOTIVATION FOR SUBMARINE DUTY
DIESEL ELECTRIC (SS) (N = 413), NUCLEAR ATTACK (SSN) (N = 118),
FLEET BALLISTIC MISSILE (SSBN) (N = 418)

CONTENT	SS Mean	SS Rank	SSN Mean	SSN Rank	SSBN Mean	SSBN Rank
Extra pay	5.88	1	5.71	1	5.97	1
Greater responsibility	4.12	5	3.53	4	4.14	4
Informal atmosphere	4.99**	2	4.08	3	4.64**	3
More competent personnel	4.75	3	4.59	2	4.91	2
Greater advancement	3.68	7	3.82	5	3.86	7
Join an "elite" outfit	4.27	4	3.31	7	4.37	5
Up & coming branch	3.69	6	3.43	6	3.90	6
Exciting operations	3.40***	8	3.37	8	2.95***	8

Rho (SS vs. SSBN) = .954***

Rho (SSN vs. SSBN) = .872***

** Statistically significant beyond the .025 level

*** Statistically significant beyond the .005 level

the SSN group has rated five of the eight given motivators for submarine duty, significantly lower (beyond .025 level) than either the SS or the SSN. Only on extra pay, advancement, and type operations, does the value assigned by the SSN equal the values given by the other submarine groups. The three groups have given approximately the same value to the importance of extra pay (5.88, 5.71, 5.97); these represent very high weights in this study.

Comparison of non-rated, petty officer, and chief petty officer (Tables III-7A, III-7B, III-7C, III-7D). The motivational pattern for the petty officer and chief petty officer groups show the same pattern as had been observed in the preceding groups. Pay as a motivator has increased in importance; the factors of competent personnel, informal atmosphere, prestige and exciting operations have decreased. The non-rated group is an exception; there are no significant differences between the values assigned by this group prior to submarine service and the values assigned after some submarine experience. This is probably due to the short period the average non-rated man has been in submarines (2.9 years).

Comparison of the present motivational pattern for submarine duty of the three groups (Table III-7D) shows very little difference among the attitudes of the men. The only significant differences in means occurs in exciting operations and more competent personnel. The non-rated group rates exciting operations significantly higher than either the petty officers or the chief petty officers. The petty

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TABLE III-7A

MOTIVATION FOR SUBMARINE DUTY
NON-RATED (N = 110)

CONTENT	ORIGINALLY		NOW	
	Mean	Rank	Mean	Rank
Extra pay	5.77	1	6.01	1
Greater responsibility	4.14	6	4.03	5
Informal atmosphere	4.92	3	4.66	3
More competent personnel	4.96	2	4.76	2
Greater advancement	4.14	6	4.03	5
Join an "elite" outfit	4.65	4	4.19	4
Up & coming branch	4.09	8	3.99	7
Exciting operations	4.34	5	3.64	8

Rho = .926***

***Statistically significant beyond the .005 level

TABLE III-7B

MOTIVATION FOR SUBMARINE DUTY
PETTY OFFICER (N = 717)

CONTENT	ORIGINALLY		NOW	
	Mean	Rank	Mean	Rank
Extra pay	5.50***	1	5.92***	1
Greater responsibility	4.02	6	4.07	4
Informal atmosphere	5.08***	3	4.82***	3
More competent personnel	5.14***	2	4.83***	2
Greater advancement	3.97*	7	3.81*	6
Join an "elite" outfit	4.72***	4	4.06***	5
Up & coming branch	4.15***	5	3.71***	7
Exciting operations	3.94***	8	3.12***	8

Rho = .919***

*Statistically significant beyond the .05 level

***Statistically significant beyond the .005 level

TABLE III-7C

MOTIVATION FOR SUBMARINE DUTY
CHIEF PETTY OFFICER (N = 122)

CONTENT	ORIGINALLY		NOW	
	Mean	Rank	Mean	Rank
Extra pay	5.50	1	5.87	1
Greater responsibility	3.92	6	4.16	4
Informal atmosphere	4.60	4	4.37	3
More competent personnel	4.83	2	4.71	2
Greater advancement	3.53	8	3.27	7
Join an "elite" outfit	4.77	3	3.88	5
Up & coming branch	4.48***	5	3.71***	6
Exciting operations	3.93***	7	3.03***	8

Rho = .852

*Statistically significant beyond the .05 level

***Statistically significant beyond the .005 level

TABLE III-7D

PRESENT MOTIVATION FOR SUBMARINE DUTY
NON-RATED (N = 110), PETTY OFFICER (N = 717), CHIEF PETTY OFFICER (N = 122)

CONTENT	NON-RATED Mean	Rank	PETTY OFFICER Mean	Rank	CPO Mean	Rank
Extra pay	5.92	1	6.01	1	5.86	1
Greater responsibility	4.07	7	3.98	4	4.16	4
Informal atmosphere	4.82	3	4.66	3	4.37	3
More competent personnel	4.83	2	3.76***	2	4.71	2
Greater advancement	3.81	5	4.03	6	3.27	7
Join an "elite" outfit	4.06	4	4.19	5	3.88	5
Up & coming branch	3.71	6	3.99	7	3.71	6
Exciting operations	3.64***	8	3.12	8	3.03	8

Rho (non rated vs. petty officer) = .974***

Rho (Petty officer vs. C.P.O.) = .972***

officers rate <u>more competent personnel</u> significantly lower than

the other two groups.

Summary. Table III-8 is a summary of the rank order of reasons

given by the sample groups for being a submarine volunteer at the

present time.

TABLE III-8

RANK ORDER SUMMARY - MOTIVATION FOR SUBMARINE DUTY

CONTENT										Mean Off.	Enl.
Extra pay	2	①	①	①	①	①	①	①	①	5.04	5.93
More competent personnel	①	2	2	2	3	5	2	2	3	5.31*	4.80
Informal atmosphere	4	3	3	3	2	3	3	3	2	4.12	4.75*
Greater responsibility	3	4	4	7	5	2	4	4	6	4.97*	4.07
Join an "elite" outfit	6	5	5	4	4	4	5	5	4	3.99	4.05
Up & coming branch	5	7	6	5	6	8	6	6	7	4.02*	3.73
Greater advancement	8	6	7	6	7	6	7	7	5	3.05	3.76*
Exciting operations	7	8	8	8	8	7	8	8	8	3.69*	3.16

*Difference in mean significant at the .005 level

The <u>order</u> of importance attached to motivators for submarine type duty changed very little from the man's pre-submarine duty period to the current period of submarine duty. The greatest changes occurred in the officers group where "extra pay" went from fourth to second place in importance and "exciting operations" went from third to seventh place. All enlisted groups had correlation factors of .910 or greater. The most significant changes occurred in the <u>values</u> given the motivational factors. Statistically significant changes beyond .005 in value occurred in all sample group categories, except non-rated, for <u>extra pay</u> (up); <u>exciting type operations</u> (down) and <u>up and coming branch</u> (down). The officers as a group regard the factors of <u>more competent personnel</u>, <u>greater responsibility</u> significantly higher (beyond the .005 level) than the enlisted group. The enlisted regard <u>extra pay</u>, <u>informal atmosphere</u>, significantly higher than the officer group.

IV. SUBMARINE PERSONNEL AND EXTRA PAY

Using a scale of one to seven, each man was asked to rate five reasons according to the effect he believed that each had on why submarine personnel should receive extra incentive pay (Appendix A, Q. 23).

<u>Officers - 1961 & 1966 (Tables IV-1A, IV-1B)</u>. Although the categories of the 1961 study were slightly different from those used in this study, it is evident that the attitudes of the officers towards submarine pay has remained fairly constant. In both periods the

TABLE IV-1A

SUBMARINE PAY OFFICER 1966 (N = 120)

CONTENT	MEAN	RANK
Dangerous environment	4.30	4
Attract superior personnel	5.37	1
Crowded living conditions	5.01	2
Greater responsibility	4.75	3
Isolated duty	3.40	5

TABLE IV-1B

SUBMARINE PAY OFFICER 1961 (N = 26)

CONTENT	%SELECTING AS 1ST CHOICE	RANK
Dangerous environment	14.3	4
Attract superior personnel	25.7	2
Crowded living conditions	17.2	3
Harder workload	5.7	6
Greater mental tension	8.6	5
Greater responsibility	28.5	1

officers expressed the opinion that they think _submarine pay_ is primarily for the purpose of attracting the best type personnel in the Navy, who are willing and able to accept additional responsibility.

Enlisted - 1961 & 1966 (Tables IV-2A, IV-2B). The enlisted attitude toward _submarine pay_ has shown a decided change since the 1961 study. _Crowded living conditions_, which were mentioned by 3 out of 5 men in 1961, has been placed behind _dangerous environment_, and _isolated duty_, in the present study.

Comparison of officer/chief petty officer/enlisted (Tables IV-3A and IV-3B). There is a negative correlation between the officers and men (-.748). The officers give much greater weight to _attract superior personnel_; enlisted personnel to _dangerous environment_, _isolated duty_. Both groups rate _living conditions_ and _responsibility_ about the same. There is no correlation between the officers and the chief petty officers. Rather the CPOs correlate more closely with the enlisted (Rho = .458), the major difference being that the CPO rate _dangerous environment_ lower than the rest of the enlisted sample.

Comparison of career/non-career, married/single (Tables IV-4A, IV-4B). The career and non-career groups are in close agreement as to why submarine personnel should get submarine pay (Rho = .945); the three highest reasons given by each group are not statistically different from one another within the group. Career personnel do rate isolated duty and superior personnel significantly higher than the non-career, however.

TABLE IV-2A

SUBMARINE PAY ENLISTED 1966 (N = 949)

CONTENT	MEAN	RANK
Dangerous environment	5.16	2
Attract superior personnel	4.47	5
Crowded living conditions	5.04	3
Greater responsibility	4.90	4
Isolated duty	5.18	1

TABLE IV-2B

SUBMARINE PAY ENLISTED 1961 (N = 337)

CONTENT	%SELECTING AS 1ST CHOICE	RANK
Dangerous environment	15.4	4
Attract superior personnel	5.3	5
Crowded living conditions	40.0	1
Greater responsibility	18.1	3
Isolated duty	21.2	2

Rank order correlation between Tables 2A and 2B = .500

TABLE IV-3A

OFFICER (N = 120) & ENLISTED (N = 949)
SUBMARINE PAY

CONTENT	OFFICER		ENLISTED	
	Mean	Rank	Mean	Rank
Dangerous environment	4.30***	4	4.16***	2
Attract superior personnel	5.37***	1	4.47***	5
Crowded living conditions	5.01	2	5.04	3
Greater responsibility	4.75	3	4.90	4
Isolated duty	3.40***	5	5.18***	1

Rho = -.748

TABLE IV-3B

OFFICER (N = 120) & CHIEF PETTY OFFICER (N = 122)
SUBMARINE PAY

CONTENT	OFFICER		CPO	
	Mean	Rank	Mean	Rank
Dangerous environment	4.30***	4	4.97***	4
Attract superior personnel	5.37**	1	4.87**	5
Crowded living conditions	5.01	2	5.16	1
Greater responsibility	4.75	3	4.96	3
Isolated duty	3.40**	5	4.92**	2

Rho = -.083

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

TABLE IV-4A

ENLISTED CAREER (N = 577) & NON-CAREER (N = 372)
SUBMARINE PAY

CONTENT	CAREER		NON-CAREER	
	Mean	Rank	Mean	Rank
Dangerous environment	5.19	2	5.11	1
Attract superior personnel	4.69***	5	4.16***	5
Crowded living conditions	5.08	3	4.98	2
Greater responsibility	4.97	4	4.79	4
Isolated duty	5.26***	1	4.96***	3

Rho = .945**

TABLE IV-4B

ENLISTED MARRIED (N = 563) & SINGLE (N = 386)
SUBMARINE PAY

CONTENT	MARRIED		SINGLE	
	Mean	Rank	Mean	Rank
Dangerous environment	5.29***	1	4.94***	2
Attract superior personnel	4.50	5	4.47	5
Crowded living conditions	5.12*	3	4.90*	3
Greater responsibility	4.97	4	4.77	4
Isolated duty	5.13	2	5.19	1

Rho = .847*

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

Married men consider the dangerous environment to be the most important reason for submarine pay, and they rate this reason significantly higher than do the single men.

Comparison of non-rated, petty officer, and chief petty officer Table IV-5A. Correlations are high except between petty officer and CPO. The only significant differences are in means of the three groups for the item, attract superior personnel. The CPO group gives this a higher value than the petty officer group or the non-rated group.

Comparison of diesel-electric (SS), nuclear attack (SSN), and fleet ballistic missile (SSBN) (Table IV-5B). These three groups show the greatest disagreement over why submarine personnel should receive extra pay. The older, less modern submarines (diesel-electric) consider poor habitability to be the primary justification for submarine pay. Surprisingly, the SSN group also rates this reason as its first choice, although significantly below the level of the diesel-electric. The SSBN considers isolated duty, the primary reason for submarine pay, which is consistent with the type operations of the SSBN. This group also considers submarine pay as a device for attracting more competent personnel—to a more significant degree than the SS or SSN group. The SSBN group gives the lowest rating of the three to dangerous environment.

TABLE IV-5A

SUBMARINE PAY

NON-RATED (N = 109), PETTY OFFICER (N = 716), CHIEF PETTY OFFICER (N = 122)

CONTENT	NON-RATED Mean	Rank	PETTY OFFICER Mean	Rank	C.P.O. Mean	Rank
Dangerous environment	5.07	2	5.18	2	4.97	4
Attract superior personnel	*4.12	5	*4.47***	5	4.87***	5
Crowded living conditions	4.65	4	5.05	3	5.16	1
Greater responsibility	4.84	3	4.87	4	4.96	3
Isolated duty	5.22	1	5.18	1	4.92	2

Rho (non-rated vs. petty officer) = .92 (significant at .025 level)

Rho (petty officer vs. CPO) = .46

*Statistically significant beyond the .05 level

**Statistically significant beyond the .005 level

TABLE IV-5B

SUBMARINE PAY

DIESEL-ELECTRIC (N = 413), NUCLEAR ATTACK (N = 118), FBM (N = 418)

CONTENT	SS		SSN		SSBN	
	Mean	Rank	Mean	Rank	Mean	Rank
Dangerous environment	5.32***	2	4.71***	4	5.13**	2
Attract superior personnel	4.21***	5	4.43	5	4.78***	4
Crowded living conditions	5.69***	1	5.11***	1	4.73***	5
Greater responsibility	4.92	3	4.80	3	4.91	3
Isolated duty	4.21***	4	5.03***	2	4.99***	1

Rho (SS vs. SSBN) = -.32
Rho (SS vs. SSN) = .74
Rho (SSN vs. SSBN) = -.01

***Statistically significant beyond the .005 level

Attitude of submarine personnel towards serving on submarines
without submarine pay. The men were asked if they would still be
volunteers for submarine duty if submarine pay were discontinued.
The following tables give the results, including comparisons with
the same question asked on the 1961 study. (Appendix A, Q. 13)

OFFICER

	1966 STUDY (N = 120)	1961 STUDY (N = 26)
Yes	53.0%	78.9%
No	30.4%	21.1%
Undecided	16.6%	*

*Not asked in 1961 study.

ENLISTED

	1966 STUDY (N = 949)	1961 STUDY (N = 327)
Yes	29.7%	51.9%
No	50.8%	45.6%
Undecided	19.5%	2.5%

ENLISTED BY SUBMARINE TYPE

	SS	SSN	SSBN
Yes	31.6%	31.4%	28.2%
No	49.2%	48.3%	51.7%
Undecided	19.2%	20.3%	20.1%

CAREER AND NON-CAREER

	CAREER (N = 577)	NON-CAREER (N = 372)
Yes	25.6%	36.1%
No	54.5%	45.1%
Undecided	19.9%	18.8%

It is the career group that most strongly cherishes submarine pay. This was also observed in the 1961 study.

When the career group is further separated by submarine type, the following distribution results:

CAREER PERSONNEL

	SS (N = 193)	SSN (N = 73)	SSBN (N = 310)
Yes	28.3%	22.9%	24.4%
No	51.8%	60.5%	55.3%
Undecided	19.9%	16.6%	20.3%

These proportions are similar to the total enlisted SS/SSN/SSBN distribution in the preceding page, except that the percentage of "No's" is greater. Note that the SSN and SSBN, in that order, would be extremely sensitive to the withdrawal of submarine pay.

Distribution of the remaining enlisted groups is as follows:

	Married	Single	Non-rated	Petty Officer	CPO
Yes	24.1	38.2	40.0	28.2	29.9
No	57.2	41.4	35.0	52.8	52.1
Undecided	18.7	20.4	25.0	19.0	18.0

Here again, it can be seen that the groups that would object most to the discontinuance of submarine pay are those who are the most mature, and have more service, i.e., the career, married, petty officers.

Summary. It would appear that there have been some motivational changes regarding the reasons submarine personnel think they rate submarine pay. As the nuclear Navy grows, the problem of long patrols at sea would naturally make the men identify submarines with the concept of isolated type duty. This has in fact occurred since the 1961 study and is particularly significant with the nuclear submarines. The concept of danger has also become more important--perhaps because of USS THRESHER. Regardless of why he thinks he deserves extra pay for submarine duty, the present day submariner feels very strongly that he should be getting it. The majority of career personnel claim they would not serve in submarines if submarine pay were discontinued.

The fact that officers consider isolated duty to be the least important factor in the need for submarine pay, is very significant. Does this infer that the officers are better able to cope with isolated duty because they are more job involved as indicated by their high rating of job satisfaction?

V. PREFERENCE FOR TYPE SUBMARINE

The questionnaire asked the following two questions (Appendix A, Q. 10 and 11):

1) List your first choice of the type submarine on which you would like to serve.

2) In the event of nuclear war, on which type submarine would you prefer to be serving?

Officers. Officers answered the first of these questions in the following manner – the 1961 study is included for comparison:

OFFICERS – COLD WAR

Choice	1966 (N = 120)	1961 (N = 26)
SS	32.2%	17.6%
SSN	45.2%	47.1%
SSBN	22.6%	35.3%

Tables V-1A and V-1B present the answers to the above two questions in the manner that the officers serving on each type submarine answered them.

For officers the nuclear attack submarine is first choice in war and peace, with second place going to the same type on which serving. Considering an all out war, the same pattern exists with the SSN gaining even more, mostly at the expense of the SS. Thus, regardless of the fact that the SSBN would play a much more significant role in a nuclear war, the majority of the officers of each type would prefer the SSN.

TABLE V-1A

CHOICE OF TYPE SUBMARINE - COLD WAR
OFFICER (N = 120)

OFFICERS SERVING ON	CHOICE PRESENT		
	SS	SSN	SSBN
SS (N = 70)	40.3%	41.8%	17.9%
SSN (N = 10)	10.0%	80.0%	10.0%
SSBN (N = 40)	23.1%	43.6%	33.3%

TABLE V-1B

CHOICE OF TYPE SUBMARINE - HOT WAR
OFFICER (N = 120)

OFFICERS SERVING ON	CHOICE NUCELAR WAR		
	SS	SSN	SSBN
SS (N = 70)	25.4%	58.2%	16.4%
SSN (N = 10)	10.0%	80.0%	10.0%
SSBN (N = 40)	2.6%	61.5%	35.9%

Enlisted. Enlisted men show quite a different pattern in selecting their preferred type of submarine during the present cold war situation and a theoretical nuclear war situation. Tables V-2A and V-2B present the results to both questions, analyzed as the members of each group answered them.

With the exception of the SSN personnel, approximately some 70% of the men serving on a particular type, preferred to remain on that type. The same condition was found in the 1961 study (4). The choice of the SSN sailor is a surprising contradiction to this observed behavior.

In a nuclear war situation about half the SS men split between SSN and SSBN. The SSN men return to SSN, while the SSBN men who had chosen SS now move to SSN.

Table V-3A and V-3B compare the choices of men serving on each of the three types in this study and in the 1961 study. Table V-4 analyzes the questions according to rate.

Comparing 1966 with 1961, it would appear that the SSBN has gained slightly in popularity among the SS and SSN personnel, while the SSN has lost popularity within its own group.

The trend for men to generally select the type submarine to which they are accustomed is also shown in the analysis of choice by the three enlisted rates. Here again, the only exceptions are the SSN petty officers and SSN chief petty officers who prefer a type submarine other than their own.

TABLE V-2A

CHOICE OF TYPE SUBMARINE - COLD WAR
ENLISTED (N = 949)

ENLISTED NOW SERVING ON	CHOICE PRESENT CONDITIONS		
	SS	SSN	SSBN
SS (N = 413)	70.0%	7.1%	22.9%
SSN (N = 178)	28.0%	39.8%	32.2%
SSBN (N = 417)	19.6%	11.2%	69.2%

TABLE V-2B

CHOICE OF TYPE SUBMARINE - HOT WAR
ENLISTED (N = 949)

ENLISTED NOW SERVING ON	CHOICE PRESENT CONDITIONS		
	SS	SSN	SSBN
SS (N = 413)	25.8%	31.6%	42.6%
SSN (N = 118)	13.4%	60.5%	26.1%
SSBN (N = 418)	6.9%	24.6%	68.5%

TABLE V-3A

CHOICE OF TYPE SUBMARINE: 1966 AND 1961
ENLISTED CAREER

| CAREER SERVING ON | CHOICE | | | | | |
| | 1966 | | | 1961 | | |
	SS	SSN	SSBN	SS	SSN	SSBN
SS	70.7%	7.3%	22.0%	75.4%	10.8%	13.8%
SSN	31.2%	35.4%	33.4%	25.0%	75.0%	0%
SSBN	18.7%	9.0%	72.3%	31.0%	3.5%	65.5%

TABLE V-3B

CHOICE OF TYPE SUBMARINE: 1966 AND 1961
ENLISTED NON-CAREER

| NON-CAREER SERVING ON | CHOICE | | | | | |
| | 1966 | | | 1961 | | |
	SS	SSN	SSBN	SS	SSN	SSBN
SS	69.6%	6.8%	23.6%	69.3%	17.9%	12.8%
SSN	29.0%	32.2%	38.8%	33.3%	50.0%	16.7%
SSBN	21.5%	17.8%	60.7%	20.0%	0%	80.0%

TABLE V-4

CHOICE OF DESIRED TYPE SUBMARINE - COLD WAR - BY RATES

NON-RATED (N = 110)

NOW SERVING ON	CHOICE OF		
	SS	SSN	SSBN
SS	70.0%	8.0%	22.0%
SSN	21.1%	52.6%	26.3%
SSBN	17.5%	17.5%	65.0%

PETTY OFFICER (N = 717)

NOW SERVING ON	CHOICE OF		
	SS	SSN	SSBN
SS	69.5%	6.0%	24.5%
SSN	27.7%	34.9%	37.4%
SSBN	20.1%	11.3%	68.6%

CHIEF PETTY OFFICER (N = 122)

NOW SERVING ON	CHOICE OF		
	SS	SSN	SSBN
SS	74.4%	12.8%	12.8%
SSN	35.3%	52.9%	11.8%
SSBN	18.6%	6.8%	74.6%

Summary. Officers prefer duty on nuclear attack submarines

both in peace and in war. Their second choice in both cases is

the type submarine on which they are currently serving. While in

peace time the greatest number of officers on each type selects the

SSN, under nuclear war conditions, the SSN becomes the majority

choice of these officers.

70% of the enlisted personnel serving on SS and SSBN choose

their own type submarine in peace time with second choice going to

the SSBN or SS, but not the SSN. The SSN personnel are almost

equally divided in their choices among the three types. This latter

pattern was not observed in the 1961 study.

Thus officers are most strongly motivated toward the SSN while

enlisted are least motivated toward the SSN. This is rather

significant since the major expansion of the submarine force will be

in the nuclear attack submarine area.

VI. PERCEIVED NEED SATISFACTIONS

The six tables in this section present data on the perceived need satisfactions of the submarine groups as developed from questions 30-51 of the questionnaire (Appendix A). The results have been grouped in five categories of Maslow's hierachial needs similar to the method employed by Porter. [19] Appendix B lists the specific questions of the questionnaire assigned to each category. Category I contains questions pertaining to the safety and security needs (seven), Category II, the social needs (three), Category III, the esteem needs (seven), Category IV, the autonomy needs (three), and Category V, the self-fulfillment needs.

The subjects were asked to rate each question using a scale ranging from "1" to "7" on how each felt that the question contributed in a positive way to the subject's _present_ feeling of satisfaction or well-being (Appendix A, Q. 30-51).

Comparison of officers and enlisted (Tables VI-1A and VI-1B. While the relative rank order correlation between the officer and enlisted samples is very high in all five categories, there are significant differences in the mean values of certain of the questions.

In the safety and security needs category, both officers and enlisted men consider that _financial security, food served_, and the _material condition of their ship_, are the needs best satisfied. The differences in the mean values assigned by each of the two groups to each of these factors is not statistically significant (beyond

the .05 level). The operating schedule of the ship, the security of dependents (housing), and the prospects of the next yard overhaul, are rated low in creating satisfaction. The enlisted group evaluates the satisfaction derived from their dependent's security at a significantly lower level than does the officer group. The officers derive significantly less satisfaction from the prospects of a yard overhaul than do the enlisted.

In the area of social needs, both groups rate sociability off the ship as low, but the enlisted group derives greater satisfaction than does the officer group.

Both officers and enlisted consider that the perceived mission of their submarine creates the highest level of satisfaction in the category of esteem needs. The officers receive significantly greater satisfaction from feeling of worth, esteem by civilians, esteem by the commanding officer, and esteem by one's immediate superior. Both groups value the satisfaction they receive from pay for their job, at approximately the same level.

Officers consider the autonomy needs of authority exercised in the job, authority and trust given for independent judgment and actions, and the opportunity for self-expression and participation in goal setting, to be more satisfied than does the enlisted group. Self-expression is considered to be least satisfied by both groups.

In the self-fulfillment needs the officers indicate a greater degree of satisfaction in self-actualization, while both groups indicate the same amount of satisfaction in self-betterment.

TABLE VI-1A

OFFICER (N = 120) & ENLISTED (N = 949)

I. SAFETY AND SECURITY NEEDS

ITEM	CONTENT	OFFICER Mean	Rank	ENLISTED Mean	Rank
30	Time in port	3.66	5	3.64	5
31	Deep submergence	4.06*	4	4.40*	4
32	Dependents security	3.21***	6	2.69*	7
33	Ship's security	4.60	3	4.74	3
34	Food	4.65	2	4.83	2
35	Financial security	5.05	1	4.86	1
42	A yard overhaul	2.87***	7	3.34***	6

Rho = .925***

II. SOCIAL NEEDS

ITEM	CONTENT	OFFICER Mean	Rank	ENLISTED Mean	Rank
36	Close friends	4.42**	2	4.74**	1
37	Help to shipmates	4.82	1	4.68	2
38	Sociability off ship	3.21***	3	3.82***	3

Rho = .964

*Statistically significant beyond the .005 level
**Statistically significant beyond the .025 level

***Statistically significant beyond the .005 level

TABLE VI-1B

III. ESTEEM NEEDS

ITEM	CONTENT	OFFICER Mean	Rank	ENLISTED Mean	Rank
41	Feeling of worth	5.03***	2	4.51***	4
44	Esteem by shipmates	4.66*	6	4.40*	6
45	Esteem by civilians	3.83	7	3.64	7
46	Esteem by C. O.	4.83***	5	4.47***	5
47	Esteem by superior	4.94**	4	4.55**	3
50	Pay for job	5.00	3	4.82	2
51	Mission of ship	5.39	1	5.26	1

Rho = .961***

IV. AUTONOMY NEEDS

ITEM	CONTENT	OFFICER Mean	Rank	ENLISTED Mean	Rank
39	Authority in job	4.71***	2	3.61***	2
40	Trust by superiors	5.04***	1	4.08***	1
43	Self-expression	3.94***	3	3.41***	3

Rho = .898

V. SELF-FULFILLMENT NEEDS

ITEM	CONTENT	OFFICER Mean	Rank	ENLISTED Mean	Rank
49	Self-fulfillment	4.89*	1	4.62*	1
48	Self-betterment	4.66	2	4.53	2

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

Comparison of officers and chief petty officers (Tables VI-2A and VI-6B. The perceived need satisfactions of the officers and chief petty officers show a very high positive correlation. The CPO does indicate significantly greater satisfaction with the mechanical and engineering condition of his ship, the help he can give to shipmates, and his sociability with crew members when off the ship. The esteem, autonomy, and self-fulfillment needs are being satisfied to an equal degree in both groups, since no significant differences in the mean values exists in these categories. The mission of the ship is by far the best satisfied need perceived by both groups, and esteem by civilians is the least satisfied need.

Comparison of enlisted career and non-career (Tables VI-3A and VI-3B). The need satisfactions of the enlisted career and non-career groups have the greatest number of significant differences of the submarine groups compared. Significant differences in the levels of need satisfaction are found in 6 of the 10 basic needs (security and social), and in 11 of the 12 higher order needs (esteem, autonomy, and self-fulfillment).

The non-career group indicates less satisfaction with the operating schedules of the ship, the mechanical security of the ship, and financial security, when compared to the career group. Only in sociability off the ship does the non-career indicate greater satisfaction than the career. The career group receives significantly greater satisfaction than the non-career group in all the higher

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TABLE VI=2A

OFFICER (N = 120) & CHIEF PETTY OFFICERS (N = 122)

I. SAFETY AND SECURITY NEEDS

ITEM	CONTENT	OFFICERS		CPO	
		Mean	Rank	Mean	Rank
30	Time in port	3.66	5	3.80	5
31	Deep submergence	4.06	4	4.37	4
32	Dependent's security	3.21	6	3.42	6
33	Ship's security	4.60**	3	5.09***	3
34	Food	4.65	2	5.30	2
35	Financial security	5.05	1	5.33	1
42	A yard overhaul	2.87	7	3.18	7

Rho = .982***

II. SOCIAL NEEDS

ITEM	CONTENT	OFFICER		CPO	
		Mean	Rank	Mean	Rank
36	Close friends	4.47	2	4.65	2
37	Help to shipmates	4.82**	1	5.19**	1
38	Sociability off ship	3.21***	3	3.93***	3

Rho = .980

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

TABLE VI-2B

III. ESTEEM NEEDS

ITEM	CONTENT	OFFICER Mean	Rank	CPO Mean	Rank
41	Feeling of worth	5.03	2	4.97	4
44	Esteem by shipmates	4.66	6	4.56	6
45	Esteem by civilians	3.83	7	3.94	7
46	Esteem by C.O.	4.83	5	5.13	2
47	Esteem by superior	4.94	4	5.06	3
50	Pay for job	5.00	3	4.95	5
51	Mission of ship	5.84	1	5.62	1

Rho = .960***

IV. AUTONOMY NEEDS

ITEM	CONTENT	OFFICER Mean	Rank	CPO Mean	Rank
39	Authority in job	4.71	2	4.53	2
40	Trust by superiors	5.04	1	4.89	1
43	Self-expression	3.94	3	4.30	3

Rho = .938

V. SELF-FULFILLMENT NEEDS

ITEM	CONTENT	OFFICER Mean	Rank	CPO Mean	Rank
49	Self-fulfillment	4.89	1	5.15	1
48	Self-betterment	4.66	2	4.54	2

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

TABLE VI-3A

ENLISTED CAREER (N = 577) & NON-CAREER (N = 372)

I. SAFETY AND SECURITY NEEDS

ITEM	CONTENT	CAREER		NON-CAREER	
		Mean	Rank	Mean	Rank
30	Time in port	3.74***	5	3.40***	5
31	Deep submergence	4.41	4	4.49	4
32	Dependent's security	3.09***	7	2.02***	7
33	Ship's security	4.91***	2	4.53***	3
34	Food	4.90	3	4.75	1
35	Financial security	5.02***	1	4.57***	2
42	A yard overhaul	3.41	6	3.21	6

Rho = .945***

II. SOCIAL NEEDS

ITEM	CONTENT	CAREER		NON-CAREER	
		Mean	Rank	Mean	Rank
36	Close friends	4.73	2	4.69	1
37	Help to shipmates	4.80***	1	4.49***	2
38	Sociability off ship	3.73**	3	3.98**	3

Rho = .936

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

TABLE VI-3B

III. ESTEEM NEEDS

ITEM	CONTENT	CAREER Mean	Rank	NON-CAREER Mean	Rank
41	Feeling of worth	4.72***	4	4.15***	5
44	Esteem by shipmates	4.52***	6	4.21***	3
45	Esteem by civilians	3.55	7	3.76	7
46	Esteem by C. O.	4.67***	5	4.08***	6
47	Esteem by superior	4.79***	3	4.17***	4
50	Pay for job	5.00***	2	4.55***	2
51	Mission of ship	5.41***	1	5.06***	1

Rho = .877***

IV. AUTONOMY NEEDS

ITEM	CONTENT	CAREER Mean	Rank	NON-CAREER Mean	Rank
39	Authority on job	3.95***	2	3.04***	3
40	Trust by superiors	4.27***	1	3.72***	1
43	Self-expression	3.54***	3	3.17***	2

Rho = .714

V. SELF-FULFILLMENT NEEDS

ITEM	CONTENT	CAREER Mean	Rank	NON-CAREER Mean	Rank
49	Self-fulfillment	4.76***	1	4.36***	1
48	Self-betterment	4.71***	2	4.23***	2

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

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order needs except one, civilian esteem. Both groups receive the same level of satisfaction from civilian esteem, and civilian esteem is ranked the lowest of the esteem needs by both groups.

Although significant differences in need satisfactions exist between the two groups, the relative importance of the needs within each category has a very high positive correlation, indicating both groups perceive the same general hierarchial ranking of need importance. Thus, both groups consider the mission of the submarine to be the most satsified esteem need, and dependent's security to be the least satisfied security need.

Comparison of enlisted married and single (Tables VI-4A and VI-4B). The married and single groups indicate equal satisfaction of all the safety and security needs. In social needs the married group is more satisfied with the social relationships aboard ship, while the single group indicates greater satisfaction with the amount of time the crew socializes when off the ship. The amount of satisfaction derived from esteem by the commanding officer, and esteem from one's superior are significantly different for the two groups. The three autonomy needs and the two self-fulfillment needs also show significant differences in satisfaction. In all cases, the married group indicates that these needs are better satisfied than those of the single group.

Comparison of diesel-electric (SS), nuclear attack (SSN), and fleet ballistic missile (SSBN) submarines (Tables VI-5A and VI-5B).

TABLE VI-4A

ENLISTED MARRIED (N - 563) & SINGLE (N = 386)

I. SAFETY AND SECURITY NEEDS

ITEM	CONTENT	MARRIED Mean	Rank	SINGLE Mean	Rank
30	Time in port	3.59	5	3.64	5
31	Deep submergence	4.36	4	4.54	4
32	Dependent's security	3.35	7	-	-
33	Ship's security	4.78	3	4.72	3
34	Food	4.80	2	4.88	1
35	Financial security	4.89	1	4.77	2
42	A yard overhaul	3.38	6	3.26	6

Rho = .876***

II. SOCIAL NEEDS

ITEM	CONTENT	MARRIED Mean	Rank	SINGLE Mean	Rank
36	Close friends	4.67	2	4.77	1
37	Help to shipmates	4.83***	1	4.47***	2
38	Sociability off ship	3.73**	3	3.95**	3

Rho = .846

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

TABLE VI-4B

III. ESTEEM NEEDS

ITEM	CONTENT	MARRIED Mean	Rank	SINGLE Mean	Rank
41	Feeling of worth	4.58	5	4.35	4
44	Esteem by shipmates	4.44	6	4.32	5
45	Esteem by civilians	3.57	7	3.74	7
46	Esteem by C. O.	4.59***	4	4.21***	6
47	Esteem by superior	4.66***	3	4.36**	3
50	Pay for job	4.88	2	4.76	2
51	Mission of ship	5.35	1	5.14	1

Rho = .954***

IV. AUTONOMY NEEDS

ITEM	CONTENT	MARRIED Mean	Rank	SINGLE Mean	Rank
39	Authority in job	3.76***	2	3.32***	2
40	Trust by superiors	4.18**	1	3.83**	1
43	Self-expression	3.52**	3	3.17**	3

Rho =.989*

V. SELF-FULFILLMENT NEEDS

ITEM	CONTENT	MARRIED Mean	Rank	SINGLE Mean	Rank
49	Self-fulfillment	4.70**	1	4.42**	1
48	Self-betterment	4.64**	2	4.34**	2

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

The three types of submarines show significant differences in perceived need satisfaction in the majority of all the need categories except the social needs.

In the basic needs of safety and security, the SSN group's level of satisfaction is more closely related to the SS group than to the SSBN group. The SSBN group indicates higher need satisfaction than the other two groups, in all but two needs – yard overhaul and deep submergence. The SSN rates the question, "your submarine at 250 feet on a stormy night," significantly higher than either the SS or SSBN groups. It is of importance to note that the men of the SSBN's indicate a significantly higher need satisfaction from the operating schedule of their type submarine, than the level of satisfaction perceived by the SS or SSN groups toward their respective operating schedules.

Interestingly, in the higher need categories, it is the SS group and the SSBN group which indicate the most similar need satisfactions. While there are significant differences in perceived need satisfactions between the SS group and the SSBN group in 5 of the 12 higher order needs, the SSN group indicates significantly less need satisfaction than either the SS or SSBN groups in 9 of the 12 higher order needs. The SSN group does not indicate higher satisfaction than the SS or SSBN, in any one of the esteem, autonomy, or self-fulfillment needs. The only three needs in which the SSN group attains comparable satisfaction level with the other two groups, are those external to the individual submarine environment – pay,

TABLE VI-5A

DIESEL ELECTRIC (SS) (N = 413), NUCLEAR ATTACK (SSN) (N = 118), AND
FLEET BALLISTIC MISSILE (FBM) (N = 418)

I. SAFETY AND SECURITY NEEDS

ITEM	CONTENT	SS		SSN		SSBN	
		Mean	Rank	Mean	Rank	Mean	Rank
30	Time in port	3.30***	6	3.11	6	4.06***	5
31	Deep submergence	4.47	3	4.69**	1	4.35**	4
32	Dependent's security	2.54**	7	2.38	7	2.88**	7
33	Ship's security	4.31***	4	4.61	4	5.24***	1
34	Food	4.55**	2	4.64	3	5.18***	2
35	Financial security	4.73**	1	4.69	1	5.00**	3
42	A yard overhaul	3.66***	5	3.33	5	3.02***	6

Rho (SS vs. SSBN) = .835** Rho (SSN vs. SSBN) = .846**

II. SOCIAL NEEDS

ITEM	CONTENT	SS		SSN		SSBN	
		Mean	Rank	Mean	Rank	Mean	Rank
36	Close friends	4.84	1	4.48	2	4.66	2
37	Help to shipmates	4.70	2	4.52	1	4.70	1
38	Sociability off ship	4.19***	3	3.64	3	3.53***	3

Rho (SS vs. SSBN) = .974   Rho (SSN vs. SSBN) = .989*

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

TABLE VI-5B

III. ESTEEM NEEDS

ITEM	CONTENT	SS		SSN		SSBN	
		Mean	Rank	Mean	Rank	Mean	Rank
41	Feeling of worth	4.65	3	4.06**	4	4.48	5
44	Esteem by shipmates	4.52	5	4.19**	3	4.35	6
45	Esteem by civilians	3.69	7	3.53	6	3.62	7
46	Esteem by C. O.	4.45**	6	3.50***	7	4.70**	3
47	Esteem by superior	4.60	4	3.99*	5	4.67	4
50	Pay for job	4.70**	2	4.82	2	4.97**	2
51	Mission of ship	4.88***	1	4.98	1	5.74***	1

Rho (SS vs. SSBN) = .726*   Rho (SSN vs. SSBN) = .960***

IV. AUTONOMY NEEDS

ITEM	CONTENT	SS		SSN		SSBN	
		Mean	Rank	Mean	Rank	Mean	Rank
39	Authority in job	3.70	2	3.11***	2	3.64	2
40	Trust by superiors	4.27	1	3.45**	1	4.02	1
43	Self-expression	3.49	3	2.74***	3	3.47	3

Rho (SS vs. SSBN) = .870   Rho (SSN vs. SSBN) = .999***

V. SELF-FULFILLMENT NEEDS

ITEM	CONTENT	SS		SSN		SSBN	
		Mean	Rank	Mean	Rank	Mean	Rank
49	Self-fulfillment	4.78*	1	4.07***	1	4.57*	2
48	Self-betterment	4.47*	2	4.05***	2	4.72*	1

*Statistically significant beyond the .05 level

***Statistically significant beyond the .005 level

civilian esteem, and mission of the ship.

Comparison of non-rated, petty officer, and chief petty officer (Tables VI-6A and VI-6B). The correlation between the petty officers and chief petty officers in the category of security needs is significantly greater than the correlation between the non-rated and petty officer. The esteem need satisfactions of the non-rated and petty officers are more significantly correlated than those of the petty officer and chief petty officer (no significant correlation exists). In the area of social needs the groups perceive the same degree of satisfaction, except in help to shipmates. The satisfaction derived from giving help and encouragement to one's shipmates, is progressively higher in a significant manner from the non-rated group to petty officer, and from the petty officer to chief petty officer.

The satisfaction attained in the higher order needs is also a function of increasing rate. With the exception of civilian esteem, all significant differences in perceived need satisfactions are positive in the direction of increasing rate. In the autonomy needs, note the great differences in means between the CPO group and the other two.

Summary (Tables VI-7A and VI-7B). The correlations of the answers to the twenty-two questions dealing with the current motivational patterns of submarine personnel were all extremely high among the sub-populations compared. All but four of the correlation coefficients were in the .80 or .90 range. The highest Rho was .999

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TABLE VI-6A

ENLISTED NON-RATED (N = 110), PETTY OFFICER (N = 717) AND CHIEF PETTY OFFICER (N = 122)

I. SAFETY AND SECURITY NEEDS

ITEM	CONTENT	NON-RATED		PETTY OFFICER		CPO	
		Mean	Rank	Mean	Rank	Mean	Rank
30	Time in port	3.66	5	3.51	5	3.80	5
31	Deep submergence	4.32	3	4.46***	4	3.37***	4
32	Dependent's security	2.21***	7	2.63***	7	3.42***	6
33	Ship's security	4.64	2	4.71**	3	5.09	3
34	Food	4.81	1	4.74***	2	5.30***	2
35	Financial security	4.28***	4	4.84**	1	5.33**	1
42	A yard overhaul	3.33	6	3.35	6	3.18	7

Rho (Non-rated vs. PO) = .675*
Rho (Rated vs. CPO) = .921***

II. SOCIAL NEEDS

ITEM	CONTENT	NON-RATED		PETTY OFFICER		CPO	
		Mean	Rank	Mean	Rank	Mean	Rank
36	Close friends	4.64	1	4.72	1	4.65	2
37	Help to shipmates	4.28**	2	4.65***	2	5.19***	1
38	Sociability off ship	3.96	3	3.77	3	3.93	3

Rho (Non-rated vs. PO) = .820
Rho (Rated vs. CPO) = .865

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

TABLE VI-6B

III. ESTEEM NEEDS

ITEM	CONTENT	NON-RATED Mean	Rank	PETTY OFFICER Mean	Rank	CPO Mean	Rank
41	Feeling of worth	4.42	3	4.41	4	4.97***	4
44	Esteem by shipmates	4.10*	7	4.40**	5	4.56**	6
45	Esteem by civilians	4.16***	6	3.50***	7	3.94***	7
46	Esteem by C. O.	4.25	5	4.33	6	5.13***	2
47	Esteem by superior	4.41	4	4.46	3	5.06***	3
50	Pay for job	4.74	2	4.81	2	4.95	5
51	Mission of ship	4.98	1	5.24***	1	5.62**	1

Rho (Non-rated vs. rated) =.830 Rho (Petty officer vs. CPO) = .348

IV. AUTONOMY NEEDS

ITEM	CONTENT	NON-RATED Mean	Rank	PETTY OFFICER Mean	Rank	CPO Mean	Rank
39	Authority in job	2.78***	3	3.53***	2	4.53***	2
40	Trust by superiors	3.69	1	3.94	1	4.89***	1
43	Self-expression	3.42	2	3.20	3	4.30***	3

Rho (Non-rated vs. rated) = .773 Rho (Petty officer vs. CPO) = .870

V. SELF-FULFILLMENT NEEDS

ITEM	CONTENT	NON-RATED Mean	Rank	PETTY OFFICER Mean	Rank	CPO Mean	Rank
49	Self-fulfillment	4.29	2	4.53	1	5.15***	1
48	Self-betterment	4.43	1	4.52	2	4.54	2

*Statistically significant beyond the .05 level
**Statistically significant beyond the .025 level
***Statistically significant beyond the .005 level

(autonomy needs of SSN vs. SSBN). Thus, there is definite similarity in the relative order of values that each submarine group assigned to the motivational needs. Although the relative ranking was very similar, in many cases there were significant differences among groups between the absolute values assigned to a particular motivational need. For example, all groups considered their knowledge of the particular mission of their submarine to be their highest order esteem need. However, among certain groups, there were statistically significant differences in the mean value reported for this particular need.

The security of submarine personnel are now best satisfied by financial security, food, and ship security, and presently least satisfied by yard overhauls, time at sea, and the status of their dependents.

The higher order needs for officers are being best achieved by the motivators of knowledge of the ship's mission, trust by superiors, and feeling of worth. The enlisted groups have high satisfaction from knowledge of the organizational mission, pay and self-betterment. In all areas where significant differences in mean values occur, the officers indicate they are receiving greater satisfaction than the enlisted.

As would be expected, the greatest number of significant differences in levels of satisfaction were found between the career and non-career enlisted. In all cases except the value placed on

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esteem by civilians, the career personnel were more satisfied than the non-career.

The SS and SSN were more similar to each other in the amount of satisfaction derived from the basic needs than they were to the SSBN. In the higher order needs, however, the SS and SSBN were the more similar. Most important, the study revealed the esteem needs of the SSN in 9 of the 12 higher order needs were significantly lower than either the SS or the SSBN. In the safety and security needs the SSBN generally had greater satisfaction than the other groups, whenever significant differences in means existed. The SS group had the highest level of satisfaction in the social needs.

In the non-rated/petty officer/CPO groups, it was observed that need satisfaction was a function of increasing rate, with the CPO showing an extremely high level of satisfaction in the security and self-fulfillment needs.

TABLE VI-1A

RANK ORDER SUMMARY OF NEED SATISFACTIONS

SAFETY AND SECURITY NEEDS

QUESTION CONTENT		RANK ORDER										
		Officer	CPO	Petty Off.	Non-rated	SS	SSN	SSBN	Career	Non-career	Married	Single
30	Time in port	5	5	5	5	6	6	5	5	5	5	5
31	Deep submergence	4	4	4	3	3	(1)*	4	4	4	4	4
32	Dependent's security	6	6	7	7	7	7	7	7	7	7	7
33	Ship's security	3	3	3	2	4	4	(1)	2	3	3	3
34	Food	2	2	2	(1)	2	3	2	3	(1)	2	(1)
35	Financial security	(1)	(1)	(1)	4	(1)	(1)*	3	(1)	2	(1)	2
42	A yard overhaul	7	7	6	6	5	5	6	6	6	6	6

*Indicates tie

II. SOCIAL NEEDS

QUESTION CONTENT		RANK ORDER										
		Officer	CPO	Petty Off.	Non-rated	SS	SSN	SSBN	Career	Non-career	Married	Single
36	Close friend aboard	2	2	(1)	(1)	(1)	2	2	2	(1)	2	(1)
37	Help a shipmate	(1)	(1)	2	2	2	(1)	(1)	(1)	2	(1)	2
38	Sociability ashore	3	3	3	3	3	3	3	3	3	3	3

TABLE VI-7B

RANK ORDER SUMMARY OF NEED SATISFACTIONS

III. ESTEEM NEEDS

QUESTION CONTENT		Officer	CPO	Petty Off.	Non-rated	SS	SSN	SSNB	Career	Non-career	Married	Single
41	Feeling of worth	2	4	4	3	3	4	5	4	5	5	4
44	Esteem by shipmates	6	6	5	7	5	3	6	6	3	6	5
45	Esteem by civilians	7	7	7	6	7	6	7	7	7	7	7
46	Esteem by C. O.	5	2	6	5	6	7	3	5	6	4	6
47	Esteem by superior	4	3	3	4	4	5	4	3	4	3	3
50	Pay for job	3	5	2	2	2	2	2	2	2	2	2
51	Mission of ship	①	①	①	①	①	①	①	①	①	①	①

IV. AUTONOMY NEEDS

QUESTION CONTENT		Officer	CPO	Petty Off.	Non-rated	SS	SSN	SSNB	Career	Non-career	Married	Single
39	Authority in job	2	2	2	3	2	2	2	2	3	2	2
40	Trust by superiors	1	1	1	1	1	1	1	1	1	1	1
43	Self-expression	3	3	3	2	3	3	3	3	2	3	3

V. SELF-FULFILLMENT NEEDS

QUESTION CONTENT	CPO HIGHER	CPO	PETTY OFF.	NON-RATED	SS	GSN	USSN	CAREER	NON-CAREER	MARRIED	SINGLE
49 Self-fulfillment	1	1	1	2	1	1	2	1	1	1	1
48 Self-betterment	2	2	2	1	2	2	1	2	2	2	2

VII. NEEDS DEEMED MOST IMPORTANT TO THE GROUP

The last question of the questionnaire asked each man to choose the three questions (from the 22 questions discussed in Section VI of this chapter) which he considered to be most important to the maintenance of his own personal morale and well-being (Appendix A, Q. 60-62).

The answers have been summarized in the following ten tables. Tables VII-1A and VII-1B are concerned with the officer samples, while Tables VII-2 through VII-9 are concerned with the enlisted sample. The tables also compare the perceived need importance of this section with the perceived need satisfaction reported in Section VI.

Summary. The officers consider that the trust and authority given them by their superiors and their ability to use their own unique capabilities and realize their own potentials (self-fulfillment) are the most important needs. Esteem by the commanding officer, and pay for the job, rank third and fourth in importance.

The enlisted groups indicate that pay for the job (esteem need), self-fulfillment, trust by superiors, financial security (security need), and time in port (operating schedule of the ship), are most important to them. These needs were within the first six most important indicated by the diesel-electric, nuclear attack, and fleet ballistic missile submarine groups. Fifty to sixty per cent of the enlisted men mention pay or financial security. With the

exception of the SSN group, the submarine enlisted men all rate pay for the job as their most important single desired need. The SSN group considers only trust and authority given by superiors to be more important than pay.

When the perceived need importance is compared to the perceived level of need satisfaction, it is seen that the desired needs which are not being satisfied are primarily in the area of the higher order needs. The only exception is time in port, and dependent's security, both of which could be considered as social needs.

Thus, the officers consider that their desired needs of trust and authority by superiors, self-fulfillment, and regard by their commanding officer, are not being achieved as the officers perceive that they should. Similarly, their desires for time-in-port and the security of their dependents, are not being achieved at the required levels.

The SS group indicates the greatest need desire-vs-fulfillment-gap is trust by superiors, and time in port. The SSN group's needs are least fulfilled in trust by superiors, time in port, self-expression, and dependent's security. Trust by superiors, time in port, and self-fulfillment, are the needs considered least satisfied by the SSBN group.

TABLE VII-1A

PERCEIVED NEED IMPORTANCE

OFFICER (N = 120)

CONTENT	% SELECTING	RANK
Trust by superiors	48.4%	1
Self-fulfillment	46.4%	2
Esteem by C. O.	32.6%	3
Pay for job	29.5%	4
Feeling of worth	29.5%	4
Time in port	22.1%	6
Financial security	18.9%	7
Mission of submarine	16.8%	8
Dependent's security	16.8%	8
Self-betterment	15.8%	10
Esteem by shipmates	12.6%	11
Ship's security	9.5%	12

TABLE VII-1B

RANK ORDER CORRELATION OF NEEDS PERCEIVED

IMPORTANT VERSUS LEVEL OF NEEDS

SATISFIED

OFFICER (N = 120)

CONTENT	RANK OF IMPORTANCE	RANK OF SATISFACTION
Trust by superiors	1	3
Self-fulfillment	2	6
Esteem by C. O.	3	7
Pay for job	4	5
Feeling of worth	4	4
Time in port	6	11
Financial security	7	2
Mission of submarine	8	1
Dependent's security	8	12
Self-betterment	10	8
Esteem by shipmates	11	9
Ship's security	12	10

Rank correlation coefficient = .448

TABLE VII-2

PERCEIVED NEED IMPORTANCE

TOTAL ENLISTED SAMPLE (N = 949)

CONTENT	% SELECTING	RANK
Pay for job	34.2%	1
Trust by superiors	25.0%	2
Self-fulfillment	23.7	3
Financial security	23.7%	4
Time in port	19.4%	5
Esteem by superior	17.6%	6
Feeling of worth	15.9%	7
Self-betterment	15.8%	8
Esteem by C. O.	14.9%	9
Dependent's security	14.4%	10
Food	14.3%	11
Esteem by shipmates	10.7%	12

TABLE VII-3

PERCEIVED NEED IMPORTANCE

DIESEL ELECTRIC (SS) (N = 413)

CONTENT	% SELECTING	RANK
Pay for job	29.2%	1
Self-fulfillment	25.2%	2
Trust by superiors	24.3%	3
Financial security	20.9%	4
Esteem by superior	20.3%	5
Time in port	19.2%	6
Esteem by C. O.	18.3%	7
Feeling of worth	15.2%	8
Food	15.2%	9
Ship's security	14.9%	10
Self-betterment	13.9%	11
Dependent's security	13.6%	12

TABLE VII-4

PERCEIVED NEED IMPORTANCE

(NUCLEAR ATTACK (SSN) (N = 118)

CONTENT	% SELECTING	RANK
Trust by superiors	28.4%	1
Pay for job	26.8%	2
Self-filfillment	17.9%	3
Time in port	16.3%	4
Feeling of worth	16.3%	5
Financial security	15.4%	6
Self-expression	13.8%	7
Dependent's security	13.0%	8
Ship's security	12.2%	9
Self-betterment	10.6%	10
Esteem by shipmates	10.6%	11
Esteem by superior	9.8%	12

TABLE VII-5

PERCEIVED NEED IMPORTANCE

FLEET BALLISTIC MISSILE (SSBN) (N = 418)

CONTENT	% SELECTING	RANK
Pay for job	36.8%	1
Financial security	26.8%	2
Trust by superior	23.5%	3
Self-fulfillment	22.6%	4
Time in port	19.3%	5
Self-betterment	18.0%	6
Esteem by superior	15.7%	7
Feeling of worth	15.4%	8
Mission of submarine	15.2%	9
Dependent's security	14.7%	10
Food	13.8%	11
Esteem by C. O.	12.7%	12

TABLE VII-6

RANK ORDER CORRELATION OF NEEDS PERCEIVED

IMPORTANT VERSUS LEVEL OF NEEDS SATISFIED

TOTAL ENLISTED SAMPLE (N = 949)

CONTENT	RANK OF IMPORTANCE	RANK OF SATISFACTION
Pay for job	1	2
Trust by superiors	2	10
Self-fulfillment	3	4
Financial security	4	1
Time in port	5	11
Esteem by superior	6	5
Feeling of worth	7	7
Self-betterment	8	6
Esteem by C. O.	9	8
Dependent's security	10	12
Food	11	3
Esteem by shipmates	12	9

Rank correlation coefficient = .322

TABLE VII-7

RANK ORDER CORRELATION OF NEEDS PERCEIVED

IMPORTANT VERSUS LEVEL OF NEEDS SATISIFED

DIESEL ELECTRIC (N = 413)

CONTENT	RANK OF IMPORTANCE	RANK OF SATISFACTION
Pay for job	1	3
Self-fulfillment	2	1
Trust by superiors	3	10
Financial security	4	2
Esteem by superior	5	6
Time in port	6	11
Esteem by C. O.	7	8
Feeling of worth	8	4
Food	9	7
Ship's security	10	12
Self-betterment	11	5
Dependent's security	12	12

Rho = .504 (Significant at the .05 level)

TABLE VII-8

RANK ORDER CORRELATION OF NEEDS PERCEIVED

IMPORTANT VERSUS LEVEL OF NEEDS SATISFIED

NUCLEAR ATTACK (SSN) (N = 110)

CONTENT	RANK OF IMPORTANCE	RANK OF SATISFACTION
Trust by superiors	1	9
Pay for job	2	1
Self-fulfillment	3	5
Time in port	4	10
Feeling of worth	5	6
Financial security	6	2
Self-expression	7	11
Dependent's security	8	12
Ship's security	9	3
Self-betterment	10	7
Esteem by shipmates	11	4
Esteem by superior	12	8

Rho = .175

TABLE VII-9

RANK ORDER CORRELATION OF NEEDS PERCEIVED

IMPORTANT VERSUS LEVEL OF NEEDS SATISFIED

FLEET BALLISTIC MISSILE (SSBN) (N = 418)

CONTENT	RANK OF IMPORTANCE	RANK OF SATISFACTION
Pay for job	1	3
Financial security	2	4
Trust by superior	3	11
Self-fulfillment	4	8
Time in port	5	10
Self-betterment	6	5
Esteem by superior	7	7
Feeling of worth	8	9
Mission of submarine	9	1
Dependent's security	10	12
Food	11	2
Esteem by C. O.	12	6

Rho = -.049

VIII. CONTENT ANALYSIS OF SUBJECTIVE REPLIES

About 37% of the officers and 12% of the enlisted men used the optional section of the questionnaire to express their opinions on the motivational patterns of submarine personnel (Appendix A - Part III). The very great majority of these comments were sincere and well conceived, and are consistent with the results of the other sections of the questionnaire.

Officers (N = 45). Comments of the officers concerned the following areas:

...Financial and morale problems associated with submarine overhauls away from home port.

...Greater responsibility needed for junior officers and enlisted. Too much regulation stiffling imagination.

...Inadequate leadership by senior officers. Lack of agreement between words and actions.

...Inequities of pay scale for enlisted men compared to civilians. Hardships caused by inequities of pro-pay and loss of submarine pay when going to shore duty.

...Need for greater compensation for long working hours and poor operating schedule.

...High caliber of submarine personnel. Comradeship of submarine environment have made Navy life worthwhile.

...Frustration due to lack of future in submarines for officers not qualified for nuclear power training.

...Responsibility to one's family.

...Better communications necessary between officers and men.

Selected comments by officers. The following comments are typical of those made by the officers:

Lieutenant Commander, age 36, 12 years service in submarines, serving on a diesel-electric.

> "Most career submarine personnel are both responsive to duty and country and also take personal pride in their particular contribution to the nation's welfare. It is this factor which most sets submarine personnel apart from other naval personnel, along with the can-do attitudes, which is a major factor in my personal satisfaction in an otherwise disappointing career. The men I have served with have made it worthwhile."

Lieutenant, age 26, 5 years service in submarines, serving on a fleet ballistic missile submarine.

> "In the nuclear navy there is such a preponderence of talent that many people do not feel challenged by the work required of them to maintain the ship. With so many of the facets of the plant rigidly regulated by higher authority, and the generally high quality of the equipment on board, there just are not as many opportunities to utilize one's imagination and initiative in the accomplishment of daily tasks."

Lieutenant, age 30, 4 years service in submarines, serving on a fleet ballistic missile submarine.

> "Regardless of what organization we are talking about, one of the major factors bearing on motivation and morale is a person's ability to do a good job, the opportunity to do this job, and the knowledge that higher authority recognizes his success in doing the job."

Commander, age 36, 15 years service in submarines, Commanding Officer of a diesel-electric submarine.

"The camaraderie within a submarine is all important; if the unit is a team, no task is too difficult, and it really doesn't matter how great the irritants."

Lieutenant Junior Grade, age 28, 2 years in submarines,

serving on a nuclear attack submarine.

"Too much work in terms of long hours and little time for home and family. Too little regard by senior officers for this command's ability to meet a schedule. Words like, "I know you men had to put in long hours and lots of work to do this - well done." are damn poor compensation for spending many months away from home and family."

Lieutenant Commander, age 33, 9 years in submarines,

serving on a diesel-electric submarine.

"The concept of being assigned a mission and to accomplish same with little but basic guidance from competent superiors when contrasted to the 'Mother Hen' policy of the surface Navy was a most brilliant incentive. The volumes of amplified guidance throughout the administrative chain of command is rapidly approaching the 'Mother Hen/Big Brother' concept."

Lieutenant, age 26, 4 years in submarines, serving on a

fleet ballistic missile submarine.

"One of the most important things which contribute to the morale of the individual is the treatment he receives from his superiors. Each individual wishes to feel important in the eyes of his superiors in at least some area. He wishes to be trusted. He wishes to be able to talk to his superior and be 'listened to.' He wishes his superior to make decisions so that he will know what to do and what to expect. He needs a superior that he can respect. What is most lacking in officers is tact, understanding and consistency when dealing with men. There is little, if any, attempt made to evaluate or train officers in this area of leadership which is so important as the Navy finds it increasingly imperative to retain skilled personnel."

Enlisted (N = 178). 70% of the comments received from the enlisted men fall into the following categories (the percentage represents the frequency of occurrence of the particular type comment):

...Lack of trust and authority granted enlisted men by officers. Lack of communications and understanding between "wardroom" and enlisted. Indifference of officers to problems of enlisted (38%).

...Operating schedule. Time away from port and family (10%).

...Proficiency pay for all (9%).

...Lack of leadership by "boy wonder" officers and "instant promotion petty"officers (8%).

...Inequities of Navy pay (5%).

Selected comments by enlisted men.

Petty officer, age 23, 2 years service in submarines, serving on diesel-electric.

> "I have found that one of the most significant factors concerning morale is contributed by the wardroom. Once they impart a feeling of trust concerning the "white hat," morale improves. Liberty and pay will always affect morale, but I feel these are secondary issues by comparison. If this "white hat" feels the responsibility he will definitely work harder and try harder because then he is one step above the civilian blue collar worker, his counterpart."

Petty officer, age 31, 10 years service in submarines, serving on fleet ballistic missile submarine.

> "I like FBM duty but dislike being away from home. As long as I am paid a respectable salary I will be happy to do my job to the best of my ability. When I am no longer treated as a man, my pay, my duty, my responsibility, then my motivation will go to zero on your scale."

Petty officer, age 24, 3 years service in submarines, serving on a nuclear attack submarine.

"Two factors: (1) Two-thirds of the enlisted personnel have more time on one job than an officer with a various number of jobs. When an enlisted man is questioned for minor things concerning his job, it becomes an insult. (2) When you have a close friend not in service or you feel doesn't have as much education or training but still makes a better living, you and your family want to know why you can't live in the same way."

Petty officer, age 21, 6 months service in submarines, serving on a fleet ballistic missile submarine.

"I believe that increased effort in the personal affairs of enlisted men be given more importance than they now have. Enlisted men are quite often regarded less important in many matters. This may be true in military matters, but in personal feelings they are definitely equal. This equality is becoming more of a reality but still has a long way to go."

Petty officer, age 24, five years service in submarines, serving on a fleet ballistic missile submarine.

"I believe that the greatest barriars lie between the enlisted opinion and the officers. I realize that there must be a leader and a follower, but let's let the enlisted have a little higher voice."

Petty officer, age 24, 5 years service in submarines, serving on a fleet ballistic missile submarine.

"They should not fluctuate a person's pay so much. For instance, giving him pro-pay while aboard a submarine and taking it away when he goes to shore duty. Pro-pay is not as such, it's strictly an incentive pay to keep technical rates in the Navy. Treat people like human beings and not like machines, or as a part of a machine which can be replaced as soon as it's broken."

Petty officer, age 26, 7 years service in submarines, serving

on a fleet ballistic missile submarine.

"One of the biggest morale factors on a submarine depends
on the officers that are serving aboard that submarine. Most
of the petty officers have been trained at some type of Class "C"
school. He is trained on a particular piece of gear. Now
along comes his division officer and tells him what is wrong
with his gear and how to fix it. To have any officer tell you
how to do your job is enough to lower the morale of the men.
The men want the right to work as they've been trained."

Chief petty officer, age 35, 15 years service in submarines,

serving on a nuclear attack submarine.

"Senior petty officers in engineering departments of SSN
type submarines are often by-passed and not trusted -this
tears down their ability to maintain control of their people in
a military situation and makes them feel be-littled and
perhaps not needed."

Petty officer, age 20, 2 years in submarines, serving on a

diesel-electric.

"The attitude in which a commissioned officer listens
to your point of view or whatever you might be explaining at
that time. All of us (commissioned or not) are men first and
military second. If you are a poor substitute for a man,
then being commissioned or rated will not make you any
better man. It will only give you the authority and respect to
which your rate is due."

Petty officer, age 26, 4 years service in submarines,

serving on a fleet ballistic missile submarine.

"Too much of what the crew does during upkeep periods
and operational patrols is dictated by instructions from
higher authority. There appears to be an attitude of 'doing
the thing to impress our superiors or remain in good faith
with them' instead of doing a good job for the sake of doing
a good job. Granted the FBM's have an important mission,
but the FBM is independent in very few areas of operation.
The officers strive to impress their superiors; the job gets
done, but morale suffers."

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"On their way to greatness many officers leave their
footprints on the shoulders of the white hat."

CHAPTER IV

SUMMARY AND CONCLUSIONS

I. SUMMARY

Attitudes of submarine personnel toward service in the Navy.

The enlisted men of the sample consider the benefits of education

and the fraternal companionship existing on submarines to be the

most important reasons for being in the Naval Service. The

significance of naval service to the security of the country

(patriotism) and the satisfaction derived from their job in the Navy,

are ranked next in importance. As a group, the submariners

consider the financial renumerations for naval service to be a

relatively insignificant reason for being in the Navy. These find-

ings are in agreement with the Connery and Waite study (1965) of

nuclear power field recruits which emphasized the importance of

the educational motivation for enlisting in the Navy. [7] Blumenfeld's

study (1965) of recently reenlisted submarine personnel also

indicated the "job and boat" orientation of submarine personnel,

and the importance to them of their social environment. [4]

Parsons (1942) mentions the importance of "comradship" which

has historically been emphasized as an ideal social relationship

in the military, but has been traditionally stronger in European

cultures than in the United States. [22]

Significant differences in reasons for being in the Navy are

found among certain sub-populations of the sample. As might be

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expected the greatest differences occur between the career and non-career groups (Rho = -.381). The career group considers the importance of retirement benefits of military service to be of the greatest importance. Education, job satisfaction, comradship, and patriotism are second in importance. Current financial security is of third order importance, but the career group considers it significantly more important for being in the Naval Service than does the non-career group. The fleet ballistic missile (SSBN) group considers education to be the most important reason for being in the Navy, and values education significantly higher than either the nuclear attack (SSN) or the diesel electric (SS) submarine groups. The SS group considers the comaraderie of navy life as the primary reason for being in the Navy.

The officer sample shows little correlation with the enlisted in regards to a career in the Navy. Officers appear to be essentially job oriented, and consider most important the nature of the jobs they do and the satisfactions they receive from these jobs. The officers are in agreement with the enlisted as to the insignificance of pay as a reason for choosing the Naval Service. Officers do regard the retirement benefits of naval service to be more important than do the enlisted. The officer sample, which has an average educational level of 16.1 years, does not consider education to be a significant reason for service in the Navy.

The importance of the above motivators have been repeatedly emphasized in studies of civilian motivation, productivity, and satisfaction. Zaleznik, et al. (1958), mention five elements which have been repeatedly determined as being important to the effectiveness of a group and to the satisfaction of its members. These elements are: the technical organization of the group; the social structure of the group; the individual task motivation; the rewards, both external and internal he receives from doing his job; and the satisfactions he obtains from being an accepted member of the group. [25]

17% of the career enlisted personnel claim that they regret their decision to make the Navy a career. Only 4% of the career officers have this feeling. Single, enlisted career personnel regret their career decision to a greater extent than do the married group (22% versus 16%). The nuclear attack submarine (SSN) group has the greatest proportion of career personnel who regret making the Navy a career (31% versus 12% for the SS and 18% for the SSBN).

Attitudes of submarine personnel toward service in submarines. All the enlisted submarine groups analyzed consider the extra incentive pay as the primary reason for originally volunteering for submarines and for now being in submarines. This reason is not only significantly much higher than the reasons considered next most important, but the importance of extra pay for submarine duty is perceived by each group to be significantly more important after

a period of duty in submarines. Also considered important is the fact that the secondary reasons for being a submarine volunteer – more competent personnel, informal atmosphere, join an elite outfit, up and coming branch, and exciting operations, have significantly decreased in importance after the men have had experience in submarines.

The above findings are consistent with those of Blumenfeld (1965) who reported that second enlistment submarine personnel were almost negatively concerned with the matters of adventure-travel-and-glamour about which a comparable first enlistment submarine group had considered much more important. [4]

Officers consider the reason of higher caliber personnel in submarines to be the most important reason for volunteering for submarine service; second is greater responsibility; and third is exciting operations, extra pay, and join an elite outfit. After a period of duty in submarines, more competent personnel remains unchanged as the primary reason but extra pay has significantly increased to second in importance. Join an elite outfit and exciting operations have significantly decreased in perceived importance. Compared to the enlisted group, officers consider more competent personnel and greater responsibility of significantly greater importance. The enlisted group considers the extra pay and informal atmosphere to be of significantly greater importance than do the officers.

There is a negative correlation between the officer and enlisted groups (-.748) as to why each group believes submarine personnel rate submarine pay. Officers consider that the purpose of attracting the most competent personnel into the submarine service is the most important reason. Enlisted personnel consider the conditions of isolated duty under which they operate to be the most important reason. The enlisted consider the danger involved in submarine operations to be of much greater relevance than do the officers. Correlations between the various enlisted groups are generally high regarding the reasons for submarine pay, except for the SS, SSN, and SSBN groups. Understandably, the SSBN rates isolated duty significantly higher than the SS or SSN, and the SS considers poor living conditions to be of significantly greater importance than do the SSN or SSBN. Surprisingly, the SSN considers crowded living conditions as the most important justification for submarine pay, and considers danger to be significantly less important than either the SS or SSBN.

Regardless of why he thinks he rates submarine pay, the submariners comprising the sample all feel very strongly about receiving it. While only 30% of the officers claim that they would leave submarines if submarine pay were discontinued, the majority of the enlisted men claim that they would no longer be "volunteers" without the extra pay. The enlisted groups that would object most to such action are those that are the most valuable and highly

trained, i.e., the career, married petty officers.

The majority of officers prefer to serve on nuclear submarines, whether in war or peace. In a nuclear war situation the majority of officers currently in each of the three types of submarines would prefer duty on an SSN rather than an SSBN. 25% of the officers now serving on the diesel electrics prefer that type even in the event of a nuclear war. 70% of the enlisted men serving in each type submarine, except the SSN, choose to remain in that type. 40% of the SSN group choose to remain on that type, the remainder dividing almost equally between the SS and the SSBN.

Perceived need importance and perceived need satisfaction. Officers consider the higher order needs to be most important for their feeling of morale and well-being. Trust and authority given to them by their superiors, the self-actualization need of using their own unique capabilities to realize their potentialities, esteem by their commanding officer, pay for the job, and feeling of worth, are in that order, the needs perceived as most important to the officers. The rank correlation between needs deemed important and perceived need satisfaction, is moderate (Rho = .448). Officers perceive the mission of their submarine, their financial security, trust by their superiors, their feeling of worth, and the pay they receive for their job, to be the needs best satisfied. The greatest gap between needs desired and level of need fulfillment occurs in

self-fulfillment, esteem by the commanding officer, time in port and dependent's security.

The enlisted groups all deem pay for the job, self-fulfillment, trust and authority given by superiors, financial security, and time in port, as their most important needs. Mission of the submarine, food served, pay for the job, close friends, material condition of the ship, and financial security, are the needs the enlisted group considers currently being best satisfied. Comparing the needs deemed most important with the needs perceived satisfied, the enlisted group indicates that trust by superiors, time in port, dependent's security (SSN only), and self-fulfillment (SSBN only) are the needs most out of balance. The comments by the enlisted men on the subjective section of the questionnaire are in agreement with the above. 30-40% of the enlisted men making comments specifically mentioned the communications gap between officers and enlisted which contributes to the enlisted men's perception of lack of trust and confidence in their abilities by officers.

A very high correlation exists between the relative order of need satisfactions indicated by both the officers and enlisted. However, in all cases where significant differences exist between the levels of satisfaction, except in the social needs, the officers indicate greater satisfaction. The greatest differences in satisfaction occur in the security, esteem and autonomy needs categories.

Comparisonsof the officer/enlisted and petty officer/chief

petty officer groups indicate need satisfaction patterns similar to

those reported by Porter (1961, 1963). Porter reported that the

greatest differences in need fulfillment between levels of management

occurred in the esteem, security, and autonomy needs, and that

these needs were more often satisfied in the middle rather than

lower levels. [19] Porter also found that the relative order of all

five categories of needs were closely correlated among the different

levels of management, but that the self-fulfillment and autonomy

needs deemed most important were generally the least satisfied at

all management levels. [20]

The one important difference between the results of this study

and those of Porter are satisfaction deficiencies found in operating

schedule and dependent's security, which are common to all

management levels in the submarine sample. The problems of long

periods away from home are obviously of much greater importance

to men serving on mobile ships than to workers in an industrial

situation.

Changing motivational patterns evident between 1961 and 1966.
The results of the 1961 and 1966 studies, although not statistically

comparable, infer some small, but probable motivational changes.

In 1966 the importance of pay as a reason for a career in the Navy

is less. The reasons for being a submarine volunteer are almost

identical in both studies. Pay is considered by far the most

important reason for being a submarine volunteer, with the diesel-electric group considering the informal relationship of submarine duty as second most important, and both the nuclear attack and fleet ballistic missile submarine considering the advantage of service with higher caliber personnel as the second most important reason.

The number of career personnel who regret making the Navy a career has increased slightly. The percentage of regrets on diesel-electric submarines has increased (from 8% to 12%). The percentage of the SSBN's has decreased (from 31% to 18%), and the percentage of regrets of the SSN's has remained approximately the same (31%). The number of enlisted men who claim they would not serve on submarines without extra pay has increased slightly from 1961 (46% in 1961; 51% in 1966).

The 1961 study showed a reluctance of 75% of the men of all submarine types to transfer to a type other than the type on which they were currently serving, with the second choice of the nuclear submarine men being diesel-electric. The 1966 study indicates a greater number of the nuclear group choosing as second choice another nuclear type. The exception is the SSN group, which is almost equally divided in choice among the three types (SS-31.2%; SSN-35.4%; SSBN-33.4%). There appears to be greater willingness in 1966 for service on the SSBN (22.0% of SS enlisted; 33.4% of

SSN enlisted, and 72.3% of SSBN). The appeal of the SSN is significantly lower than in 1961 (1966 choice of SSN: 7.3% of SS; 35.4% of SSN, and 9.0% of SSBN).

Clearly indicated shifts in attitudes regarding submarine pay have occurred between the 1961 and 1966 studies. Isolated duty and dangerous environment are the two most important reasons that submarine personnel in 1966 consider as justification for extra incentive pay for submarine duty. The significant shifts since 1961 have been in crowded living conditions, which dropped from first ranked in 1961 to third ranked in 1966, and dangerous environment which increased from fourth ranked to second ranked.

In 1961 three times as many men serving on nuclear boats as serving on diesel electric indicated an over-all negative feeling of job satisfaction. While the two studies cannot be directly compared in the area of total job satisfaction, the results of the 1966 study indicate (Tables VI-5A and VI-5B) that needs of the fleet ballistic missile group are slightly better satisfied than the diesel-electric group and that the needs of both the fleet ballistic missile and diesel-electric groups are better satisfied than those of the nuclear attack submarine.

Different motivational patterns existing between various sub-populations of the sample. The greatest differences among replies received from the sample occur between 1) officers and enlisted,

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2) petty officers and chief petty officers, 3) enlisted career and
non-career, and 4) enlisted men serving on the three types of
submarines.

Officers show a greater need fulfillment in the esteem, autonomy,
and self-fulfillment categories; enlisted receive greater satisfaction
in the social needs. Both officers and enlisted have almost equal
satisfaction in the security needs (dependent's security being the
major exception).

The chief petty officer group indicates greater satisfaction than
the petty officer group in all categories. Likewise, the enlisted
career group is better satisfied than the non-career group in nearly
all the need areas.

The SSBN have greater satisfaction in all areas, except the
social needs, than the other two type submarines. The SS indicates
greater satisfaction in the social needs than the other two type
submarines. The SSN indicates less satisfaction than either the
SS or the SSBN in practically all need areas where significant
differences exist.

II. CONCLUSIONS

Significant differences exist in the motivational patterns and job satisfactions between the officers and enlisted men of the Submarine Force. Minor differences exist between sub-populations of the enlisted sample, primarily differences influenced by the man's rate and the type submarine on which he is serving. The significant differences between the motivations of the career and the non-career groups, in which the career personnel indicate greater satisfaction in all those factors directly related to Navy life, establishes a measure of face validity for this study.

The study has shown the importance that submariners, particularly the enlisted, attach to pay. However, it is considered very significant that this concern over pay is in relative terms rather than absolute pay values. Many men, both officers and enlisted, commented on the inequity of military pay compared to civilian pay, but very few mentioned that their pay was jeopardizing their basic subsistence needs. Proficiency pay (pro-pay) was quite frequently mentioned by the enlisted men as being unfair - unfair because some men on the submarine received it and some did not, or that it was received at some times and not at other times. Not one of the men commented that pro-pay was too low, nor did anyone comment that submarine pay was too low. Pay was ranked by the enlisted group as their most important need and by officers as the fourth most important need. Yet, in relative order of needs satisfied,

pay is ranked second and fifth, respectively, by the two groups, indicating relatively little need deficiency in this area. Submarine pay is considered most important to the career man and to those who have been accustomed to receiving it. The author concludes that submarine pay is an esteem factor that those who serve in this unique branch of the Navy consider in much the same light as the wearing of their "dolphins" - one of the priviliges of being a "submariner."

Herzberg (1959) was one of the first to describe this pay phenomenon in civilian industry. [13] He found that when salary was mentioned by men with low job satisfaction, it was most frequently associated with advancement and work itself; it almost always referred to increases in salaries rather than the absolute levels. In contrast, when salary was mentioned by men with high satisfaction, it was considered something that went along with a person's achievement; it meant something more than money, it meant a job well done. Thus, Herzberg concluded that as an affector of job attitudes, salary has more potency as a job dissatisfier than as a job satisfier.

The author concludes that pay is not a "satisfier" for service in the Navy or in submarines. It is suggested that the difference in importance that the enlisted attribute to pay compared to officers is a result of the enlisted's inability to match the officer's perceived level of job satisfaction in the areas of recognition, achievement,

and interesting work. The less the opportunity for the true

"motivators" to appear, the greater becomes the importance of

the hygienic factors of salary, time at sea, organizational policy

and administration, and working conditions. The factors that

lead to positive job attitudes do so because they satisfy the

individual's need for self-actualization in his work aboard ship.

The greater importance that both officers and enlisted attribute to

pay after a period of submarine service indicates that the "satisfiers"

that the men had hoped to increase by joining the submarine service

have not been achieved in the extent to which they aspired.

Submarine officers indicate greater satisfaction with a career

in the Navy than do the enlisted men sampled. This is corroborated

by the data indicating that a definite gap exists between officers

and men as to their perceived level of satisfaction in the naval

environment, even though the need aspirations of both groups was

shown to be very similar. This study indicates that the most

important need-deficiency of the enlisted submariner is the lack of

authority and trust granted them by officers for independent judgments

and actions. Giving the enlisted submariner a greater measure of

control over the way he does his individual job might allow him to

realize a greater sense of achievement and personal worth.

The officer-enlisted satisfaction level relationship appears

similar to the results obtained in an empirical study by Leavitt (1951).

Leavitt investigated the relationship between the behavior of small

groups and the patterns of communication in which the groups operated. [26] He reported that in highly structured organizations those men with the greatest amount of independence (the leaders), have the highest satisfaction. Those whose indpendence of action is limited relative to other members of the group (followers) will show low satisfaction because they have little opportunity for prestige, activity, or self-expression.

A greater desire for service in the fleet ballistic missile submarine has taken place in the last five years. A similar desire by enlisted personnel for service in the nuclear attack submarine is not evident. The reasons for this only can be conjectured. The majority of the SSBN's are finished the construction phase and on the most regular and predictable operating schedule possible for a submarine. The expanding SSN force and the SubSafe Program can be causing the personnel inconveniences and irritants reminescent of the SSBN program five years ago. The study attests to the higher satisfaction of the SSBN group with their operating schedules as compared to the other types of submarines. The study also indicates the very great general dislike of all submarine personnel for yard overhaul periods.

The motivational differences between the diesel-electric (SS) and fleet ballistic missile (SSBN) submarines are slight and subtle. The FBM groups appear more "job oriented" while the SS group appears to be more "group oriented". The aspirations of the SSBN

appear to be greater than the SS group in the higher order needs. Although the SSBN attains greater satisfaction than the SS (whenever differences occur) in all need areas except the social, the gap between the needs desired and those attained is greater in the SSBN group than in the SS group.

While total job satisfaction cannot be taken merely as the arithmetic sum of the individual need satisfactions, (11), this study indicates that the nuclear attack submarine men are attaining significantly less satisfaction than either the diesel electric or fleet ballistic missile submarines, in the majority of the need areas considered. Although many reasons may be available as to why this condition might exist, the fact that it does exist at this point in time, is considered worthy of attention.

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APPENDIX A

This questionnaire is being used for research on the subject of motivation of submarine personnel. It is being sent to a number of submarines in the Atlantic and Pacific Fleets. Your frank and honest answers are requested. Generally for questions of this type, first impressions are more valid than prolonged reasoning as to the nature of the question itself. Please try to give an answer to each question. No identifications will be used with the individuals or particular ships.

PART I

Answer the following questions by placing appropriate number code in the spaces provided.

1. Officer/enlisted (off 1; enl 2) _____
2. Rank/rate (off 1-6; non-rated 1; PO 2; CPO 3) _____
3. Age in years (two digits) _____
4. Years education (two digits) _____
5. Years active service (two digits) _____
6. Years in submarines (two digits) _____
7. Career Navy? (seven or more years obligated service (yes 1; no 2) _____
8. Married/single (married 1; single 2) _____
9. Type submarine (SS 1; SSN 2; SSBN 3) _____
10. List your first choice of the type submarine on which you would like to serve

   Diesel-electric (1)
   Nuclear attack (2)
   Fleet ballistic (3) _____

11. In the event of a nuclear war on which type of submarine would you prefer to be serving? _____

   Diesel-electric (1)
   Nuclear attack (2)
   Fleet ballistic (3) _____

12. If you are career Navy, do you regret the decision?

   Yes   (1)
   No   (2)
   Undecided   (3) _____

13. If submarine pay were to be discontinued, would you still wish to serve in submarines?

Yes   (1)
No   (2)
Undecided   (3)   _____

PART II

After each of the following questions is a group of reasons associated by submarine personnel with questions. Rate each of the given reasons by placing a number from 1 to 7 in the appropriate space according to the below scale:

No effect | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very great

20. Rate the below reasons according to the effect they have had on why you are in the Navy NOW

1. Patriotism   _____
2. Enlistment has not expired   _____
3. Financial security   _____
4. Enjoy my job   _____
5. Good friends and shipmates   _____
6. Retirement benefits   _____
7. Interesting duties   _____
8. Adventure   _____
9. Education   _____

21. Rate the below reasons according to the effect that they had on why you originally volunteered for submarine duty

1. Extra pay   _____
2. Greater responsibility   _____
3. Informal atmosphere   _____
4. More competent personnel   _____
5. Greater advancement opportunity   _____
6. To join an 'elite' outfit   _____
7. 'Up and coming branch' of the Navy _____
8. Exciting type operations   _____

22. Rate the below reasons according to the effect that they
    now have on you still being a volunteer for submarine duty.

    1. Extra pay _____
    2. Greater responsibility _____
    3. Informal atmosphere _____
    4. More competent personnel _____
    5. Greater advancement opportunity _____
    6. To join an 'elite' outfit _____
    7. 'Up and coming' branch of the Navy _____
    8. Exciting type operations _____

23. Rate the below reasons according to the effect you believe
    they have on why you should get extra pay for submarine
    duty

    1. Dangerous environment _____
    2. To attract superior personnel _____
    3. Crowded living conditions _____
    4. Greater responsibility _____
    5. Isolated duty _____

Using the scale given below rate the following questions on how you
feel each contributes in a positive way to your PRESENT feeling of
satisfaction and general well-being (i.e., morale). Place a number
from 1 to 7 in the space provided. For example, selection of 2-4
would indicate little to moderate satisfaction; 4-6 would indicate
moderate to great satisfaction. The number 1 would indicate that
you derive no satisfaction from or are indifferent to, the situation
posed by the question.

No satisfaction | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Very great satisfaction
(Indifferent)

30. The operating schedule of your type submarine _____

31. Your submarine at 250 feet on a stormy night _____

32. The housing situation of your dependents _____

33. The mechanical and engineering condition of the ship _____

34. The food served aboard your ship _____

35. Your financial solvency _____

36. The number of close friends you have on board _____

37. The amount of help or encouragement you can give to

any of your shipmates during a patrol or operation   _____

38. The amount of time the crew spends together during
liberty   _____

39. The authority you have in your present assignment   _____

40. The authority and trust given you by your superiors
for independent judgments and actions   _____

41. Your feeling of worth to your ship   _____

42. Your feelings concerning the next yard overhaul   _____

43. The opportunity you have to express your ideas
concerning liberty, leave, and recreation policies   _____

44. Your feeling of how your shipmates regard you and
your job aboard ship.   _____

45. Your feeling of how civilians regard your job in the Navy   _____

46. Your feeling of how the Commanding Officer regards
you and your job aboard ship   _____

47. Your feeling of how your immediate superior regards
you and your job aboard ship   _____

48. Your opportunity for bettering yourself in your
present situation   _____

49. Your feeling of self-fulfillment in your job on your
submarine (the feeling of being able to use your own
unique capabilities and realize your own potentialities)   _____

50. The pay you receive for your job on your submarine   _____

51. Your understanding of what is the mission of this
submarine in the particular operations in which it
takes part   _____

From questions 30 to 51 choose the three questions which you
consider to be most _important_ to the maintaining of your own
personal morale. List the questions by their numbers in the
three spaces provided

          60.   _____
          61.   _____
          62.   _____

PART III
(Optional)

You may use the rest of this page to list the factors that you believe
have an effect or bearing on the motivations and morale of submarine
men. Communication barriers in an organization, whether the Navy
or civilian industry, hinder the potential effectiveness of the
organization. Opinion sampling of this type tries to find out what
you really think, not what others assume you think. Thus your
opinions expressed in your own words can be most significant.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

APPENDIX B

I. SAFETY AND SECURITY NEEDS

30. The operating schedule of your type submarine

31. Your submarine at 250 feet on a stormy night

32. The housing situation of your dependents

33. The mechanical and engineering condition of the ship

34. The food served aboard your ship

35. Your financial solvency

42. Your feelings concerning the next yard overhaul

II. SOCIAL NEEDS

36. The number of close friends you have on board

37. The amount of help or encouragement you can give to any of your shipmates during a patrol or operation

38. The amount of time the crew spends together during liberty

III. ESTEEM NEEDS

41. Your feeling of worth to your ship

44. Your feeling of how your shipmates regard you and your job aboard ship

45. Your feeling of how civilians regard your job in the Navy

46. Your feeling of how the Commanding Officer regards you and your job aboard ship

47. Your feeling of how your immediate superior regards you and your job aboard ship

50. The pay you receive for your job on your submarine

51. Your understanding of what is the mission of this submarine in the particular operations in which it takes part

IV. AUTONOMY NEEDS

39. The authority you have in your present assignment

40. The authority and trust given you by your superiors for independent judgments and actions

43. The opportunity you have to express your ideas concerning liberty, leave, and recreation policies.

V. SELF-FULFILLMENT NEEDS

49. Your feeling of self-fulfillment in your job on your submarine (the feeling of being able to use your own unique capabilities and realize your own potentialities)

48. Your opportunity for bettering yourself in your present position

APPENDIX C

SUBMARINES UTILIZED FOR THE STUDY

ATLANTIC FLEET

    A. LINCOLN (SSBN 602) (G)
*A. JACKSON (SSBN 619) (B)
  BECUNA (SS 319)
  CAVALLA (AGSS 244)
  CUBERA (SS 347)
  D. WEBSTER (SSBN 626) (B)
  D. WEBSTER (SSBN 626) (G)
*DACE (SSN 607)
  DOGFISH (SS 350)
  E. ALLEN (SSBN 608) (B)
  G. WASHINGTON (SSBN 598) (B)
  GRAMPUS (SS 523)
  HARDER (SS 568)
  JACK (SSN 603)
*LAFAYETTE (SSBN 616) (B)
  NAUTILUS (SSN 571)
  ODAX (SS 484)
  P. HENRY (SSBN 599) (G)
  PICUDA (SS 382)
  REQUIN (SS 481)
  S. HOUSTON (SSBN 609)
  SEA OWL (SS 405)
  SENNET (SS 408)
  SIRAGO (SS 485)
  SKIPJACK (SSN 585)
  T. ROOSEVELT (SSBN 600) (B)
  T. A. EDISON (SSBN 610) (G)
*T. JEFFERSON (SSBN 618) (B)
  W. WILSON (SSBN 624) (B)
  W. WILSON (SSBN 624) (G)

PACIFIC FLEET

  BARB (SSN 596)
  BARBEL (SS 580)
  BLACKFIN (SS 322)
  D. BOONE (SSBN 629) (B)
  D. BOONE (SSBN 629) (G)
  CAIMAN (SS 323)
  CARBONERO (SS 377)
  CATFISH (SS 339)

CHARR (SS 328)
U. S. GRANT (SSBN 631) (B)
STONEWALL JACKSON (SSBN 634) (G)
MENHADEN (SS 377)
PERMIT (SSN 594)
REMORA (SS 487)
ROCK (AGSS 274)
RONQUIL (SS 396)
*SCAMP (SSN 588)
SWORDFISH (SSN 579)
TANG (SS 563)
TIRU (SS 416)

*Indicates that replies were never received from these submarines.

```
      PROGRAM UBOAT
      DIMENSION KSUB(3),KNAV(3),KM10(3),KM11(3),KM13(3),KSUBM10(3,3),
     1KSUBM11(3,3),KSUBM13(3,3)
      DIMENSION KMAR(3),KM12(3),KNAVM12(3,3)
   10 FORMAT(2I1,4F2.0,7I1,52F1.0,I3)
  101 FORMAT(7X,3HAGE,7X,4HEDUC,7X,4HACDU,4X,5HSUBDU,7X,3HNOQ,/,
     16X,F5.2,5X,F5.2,6X,F5.2,4X,F5.2,7X,I4)
  102 FORMAT(5X,2HQ9,5X,I4,5X,I4,5X,I4)
  103 FORMAT(5X,2HQ7,5X,I4,5X,I4,5X,I4)
  104 FORMAT(5X,3HQ10,4X,I4,5X,I4,5X,I4)
  105 FORMAT(5X,3HQ11,4X,I4,5X,I4,5X,I4)
  106 FORMAT(5X,3HQ13,4X,I4,5X,I4,5X,I4,//)
  107 FORMAT(23X,2HSS,8X,3HSSN,7X,4HSSBN,/,
     15X,2HSS,11X,I4,6X,I4,6X,I4,/,
     25X,3HSSN,10X,I4,6X,I4,6X,I4,/,
     35X,4HSSBN,9X,I4,6X,I4,6X,I4,//)
  108 FORMAT(23X,2HSS,8X,3HSSN,7X,4HSSBN,/,
     15X,2HSS,11X,I4,6X,I4,6X,I4,/,
     25X,3HSSN,10X,I4,6X,I4,6X,I4,/,
     35X,4HSSBN,9X,I4,6X,I4,6X,I4,//)
  109 FORMAT(23X,3HYFS,8X,2HNO,7X,5HUNDEC,/,
     15X,2HSS,11X,I4,6X,I4,6X,I4,/,
     25X,3HSSN,10X,I4,6X,I4,6X,I4,/,
     35X,4HSSBN,9X,I4,6X,I4,6X,I4,//)
  115 FORMAT(5X,2HQ8,5X,I4,5X,I4)
  116 FORMAT(5X,3HQ12,10X,I4,6X,I4,6X,I4)
  117 READ 118,N
  118 FORMAT(I4)
      IF(N-9999)120,121,121
  120 DO 11 I=1,3
      KSUB(I)=0
      KNAV(I)=0
      KMAR(I)=0
      KM10(I)=0
      KM11(I)=0
      KM12(I)=0
```

```
      KM13(I)=0
      DO 11 J=1,3
      KSUBM10(I,J)=0
      KSUBM11(I,J)=0
      KNAVM12(I,J) = 0
   11 KSUBM13(I,J)=0
      SAGE=0.0
      SEDUC=0.0
      SACDU=0.0
      SSUBDU=0.0
      NOQ=0
  200 READ 10,IDENT,LEVEL,AGE,EDUC,ACDU,SUBDU,NAV,MAR,MSUB,M10,M11,M12,
     1M13,Q201,Q202,Q203,Q204,Q205,Q206,Q207,Q208,Q209,Q211,Q212,Q213,
     2Q214,Q215,Q216,Q217,Q218,Q221,Q222,Q223,Q224,Q225,Q226,Q227,Q228,
     3Q231,Q232,Q233,Q234,Q235,
     4Q30,Q31,Q32,Q33,Q34,Q35,Q36,Q37,Q38,Q39,Q40,Q41,Q42,Q43,Q44,Q45,
     5Q46,Q47,Q48,Q49,Q50,Q51,ITEM
      IF(ITEM-999)50,51,51
   50 KSUB(MSUB)=KSUB(MSUB)+1
      KNAV(NAV)=KNAV(NAV)+1
      KMAR(MAR)=KMAR(MAR)+1
      KM10(M10)=KM10(M10)+1
      KM11(M11)=KM11(M11)+1
      KM12(M12)=KM12(M12)+1
      KM13(M13)=KM13(M13)+1
      KNAVM12(NAV,M12)=KNAVM12(NAV,M12)+1
      KSUBM10(MSUB,M10)=KSUBM10(MSUB,M10)+1
      KSUBM11(MSUB,M11)=KSUBM11(MSUB,M11)+1
      KSUBM13(MSUB,M13)=KSUBM13(MSUB,M13)+1
      SAGE=SAGE+AGE
      SEDUC=SEDUC+EDUC
      SACDU=SACDU+ACDU
      SSUBDU=SSUBDU+SUBDU
      NOQ=NOQ+1
      GO TO 200
   51 ZN=NOQ
```

```
      AAGE=SAGE/ZN
      AEDU=SEDUC/ZN
      AACDU=SACDU/ZN
      ASUBDU=SSUBDU/ZN
      PRINT 101,AAGE,AEDU,AACDU,ASUBDU,NOO
      PRINT 115,KMAR(1),KMAR(2)
      PRINT 102,KSUB(1),KSUB(2),KSUB(3)
      PRINT 103,KNAV(1),KNAV(2),KNAV(3)
      PRINT 116,KNAVM12(1,1),KNAVM12(1,2),KNAVM12(1,3)
      PRINT 104,KM10(1),KM10(2),KM10(3)
      PRINT 105,KM11(1),KM11(2),KM11(3)
      PRINT 106,KM13(1),KM13(2),KM13(3)
      PRINT 107,KSUBM10(1,1),KSUBM10(1,2),KSUBM10(1,3)
     1         KSUBM10(2,1),KSUBM10(2,2),KSUBM10(2,3)
     2         KSUBM10(3,1),KSUBM10(3,2),KSUBM10(3,3)
      PRINT 108,KSUBM11(1,1),KSUBM11(1,2),KSUBM11(1,3)
     1         KSUBM11(2,1),KSUBM11(2,2),KSUBM11(2,3)
     2         KSUBM11(3,1),KSUBM11(3,2),KSUBM11(3,3)
      PRINT 109,KSUBM13(1,1),KSUBM13(1,2),KSUBM13(1,3)
     1         KSUBM13(2,1),KSUBM13(2,2),KSUBM13(2,3)
     2         KSUBM13(3,1),KSUBM13(3,2),KSUBM13(3,3)
      GO TO 117
  121 END
```

```
      PROGRAM UBOAT15
C     STD DEVIATIONS   QUESTIONS 20-51
      DIMENSION SUMX(52),SUMSQ(52), XBAR(52), VAR(52), STDEV(52)
      DIMENSION F(52)
      DIMENSION ESTDEV(52)
      DIMENSION SXBARSQ(52)
  200 READ 10,N
   10 FORMAT(I4)
      IF(N-9999)101,102,102
  101 DO 100 K = 1,52
      SUMX(K) = 0.0
  100 SUMSQ(K) = 0.0
      DO 20 J=1,N
      READ 1000,F
 1000 FORMAT(17X,52F1.0)
      DO 30 I=1,52
      SUMX(I) = SUMX(I) + F(I)
   30 SUMSQ(I) = SUMSQ(I) + F(I)**2
   20 CONTINUE
      ZN=N
      DO 50 I=1,52
      XBAR(I)=SUMX(I)/ZN
      VAR(I)=(ZN*SUMSQ(I)-SUMX(I)**2)/(ZN*(ZN-1.0))
      IF(VAR(I))21,22,22
   21 PRINT 23,I, VAR(I)
   23 FORMAT(1X,4HVAR(,I4,2H)=,E12.5)
      STOP 24
   22 STDEV(I)= SQRTF(VAR(I))
      ESTDEV(I)=STDEV(I)/SQRTF(ZN)
      SXBARSQ(I)=ESTDEV(I)**2
   50 CONTINUE
      PRINT 13,N
   13 FORMAT(5HNR = I4,//)
      PRINT 14
   14 FORMAT(10X,4HXBAR,6X,8HVARIANCE,7X,7HSTD DEV,8X,9HSTD ERROR,9X,
     113HSTD ERROR SQR)
      PRINT 15,(XBAR(I),VAR(I),STDEV(I),ESTDEV(I),SXBARSQ(I),I=1,52)
   15 FORMAT(9X,F5.3,5X,F10.3,5X,F10.3,5X,F10.3,5X,F10.4)
      GO TO 200
  102 END
      END
```

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11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY

13. ABSTRACT

1069 questionnaires from officers and men of 44 submarines of the U. S. Atlantic and Pacific Fleets were analyzed to determine existing motivations for service in the Navy and in submarines, and to compare the level of perceived need satisfactions with perceived need importance. Significant differences between the motivational patterns of officers and enlisted men were discovered, with the officers generally more "job motivated" than the enlisted. The implications of pay as a "motivator" were discussed. Minor differences were found among the sub-populations of the enlisted sample, primarily among different types of submarines. The fleet ballistic missile submarine group appeared to be the most highly "job oriented" and the diesel electric group the most "group or boat oriented." The nuclear attack submarine group appeared to be the least satisfied of the three submarine groups. The most significant deficiency perceived by all enlisted groups was the lack of trust and authority granted them for independent judgments and actions.

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14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
MOTIVATION						
SUBMARINE PERSONNEL ATTITUDES						
JOB SATISFACTION						
SUBMARINE PAY						
OPINION QUESTIONNAIRES						
ATTITUDE SURVEYS						
NEED IMPORTANCE						

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